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VOL. I.—11TH YEAR.

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GLYCOSURIA AND DIABETES.¹

By the late GEORGE E. RENNIE, M.D. (London),
F.R.C.P. (London),
Sydney.

I MUST first of all express to you my appreciation of the honour you have conferred upon me in inviting me to come and address you. In thinking over a suitable subject, it occurred to me that "Glycosuria and Diabetes" is one which is of importance to every practitioner of medicine and one in which there has been a great amount of work done in recent years.

If you read the text-book descriptions of the disease *diabetes mellitus*, I think you will agree with me that there is a want of clearness in deciding what is and what is not to be included under this heading: there is not a clear differentiation between the symptom glycosuria and the disease *diabetes mellitus*.

Glycosuria.

At the outset it is essential to remember that glycosuria or the excretion of sugar in the urine is a symptom which, while a prominent one in the disease *diabetes mellitus*, is yet met with in a variety

of other conditions in which it may be only an accidental or quite unimportant symptom. Hence we want to be able to establish some definite criteria to enable us to say whether a patient whose urine has been found to contain sugar, is suffering from the disease we call diabetes or whether the glycosuria is only a symptom of some other disease. This is not a matter merely of academic or scientific interest. It is one which concerns the practitioner in every department of practice. It is of extreme importance in connexion with life insurance, for a proponent may be quite unjustly rejected for life insurance in consequence of the discovery of sugar in the urine. Nevertheless, as Dr. Leyton, of the London Hospital, says: "Not every person who has definite glycosuria is suffering from *diabetes mellitus*, although it is well to assume that he is until sufficient data have been collected to prove the contrary."

In healthy persons the normal amount of dextrose excreted in the urine is 0.02%. This amount can only be recognized by specially sensitive tests. A person is said to be suffering from glycosuria when the ordinary tests demonstrate the presence of a reducing substance which ferments with yeast, and forms an osazone similar to dextrosazone. It requires the presence of 0.1% of dextrose to give these reactions.

¹ Read at a meeting of the Queensland Branch of the British Medical Association on February 1, 1924.

There is normally a small amount of sugar in the blood of every person, but the figures obtained by different observers using different methods vary between 0.04% and 0.19%. It is recognized, however, that the percentage of sugar in the blood is not a fixed quantity even in health, but varies within limits which have a comparatively narrow range. Many investigations have been undertaken to solve the problem of how the blood sugar is maintained at such a fairly even level. Thus Cammidge, Forsyth and Howard⁽¹⁾ in studying this question found that after a fast of twelve to sixteen hours the sugar content of the blood in fifty human beings averaged 0.08%; that, although the same person or animal does not invariably give exactly the same fasting values, the length of the fast does not appear to exert any material influence on the proportion of sugar in the peripheral blood. Allen came to the same conclusion and states that "approximately the normal percentage of blood sugar is stubbornly maintained through prolonged starvation almost up to death." These observers conclude "that in the fasting condition and after a meal the level of the blood sugar is determined by the interplay of a number of influences, some of which accelerate the production of sugar, while others inhibit the process and promote the formation of glycogen, but that under average conditions the food itself takes no direct part in the process."

The maintenance of the blood sugar at a fairly uniform percentage is apparently necessary not only for the preservation of normal health, but even of life itself, for we read that in the course of the recent investigations of Banting and others in Toronto, when the percentage of blood sugar in the rabbit was reduced to 0.045 after injections of "Insulin," violent convulsions occurred. In human beings various symptoms appeared when the blood sugar fell below normal after injections of "Insulin," such as a sense of weakness and fatigue, tremulousness, loss of emotional control, deafness, difficulty in articulation, delirium and disorientation. These symptoms were all promptly relieved by administration of glucose.

In diabetes we find that there is, general speaking, an increase in the percentage of blood sugar, but this again is variable in different stages of the disease. The rise in blood sugar is attributed to the failure of the liver to store glycogen, followed by a diminution in the power of the tissues to consume sugar. The tissues, though bathed in a medium containing an increased amount of sugar, are unable to utilize the sugar.

Winter and Smith⁽²⁾ working in the biochemical laboratory at Cambridge have recently published some researches which seem to indicate that the sugar present in the blood of normal healthy persons is not the stable "α" or "β" glucose, but an unstable "γ" glucose, while the sugar in the blood of diabetics is the stable "α" or "β" glucose. Inasmuch as the tissues can only utilize the unstable "γ" glucose the failure of the tissues in diabetics to utilize sugar is thus explained. These investigators suggest that the conversion of the stable to the un-

stable glucose is brought about by the action of an enzyme and this enzyme is probably the pancreatic hormone called "Insulin." The absence of this enzyme in diabetics thus prevents the utilization of sugar by the tissues and favours its accumulation in the blood. The administration of "Insulin" thus effects the conversion of the glucose, its utilization by the tissues and its disappearance from the blood.

A rise in the blood sugar or a condition of hyperglycemia as it is called is not necessarily accompanied by glycosuria, for the renal threshold for the excretion of sugar must be below the percentage of blood sugar for the occurrence of the latter symptom. It appears to be true that the renal threshold in diabetes is lower in younger patients and in mild cases, but with the progress of the disease and the increase in the percentage of the blood sugar there is a rise in the renal threshold; in some instances it may be very high with but very little excretion of sugar in the urine. This is obviously an attempt on the part of Nature to conserve valuable food material, though the persistent high percentage of blood sugar is detrimental to the tissues.

It has been commonly stated that the glycosuria of elderly persons has a significance very different from that which occurs in young adults or children. In the latter the discovery of sugar in the urine is considered to be of very grave import. Recent investigations, however, have shown that the gravity of the prognosis in glycosuria varies not with the age of the patient, but with a variety of conditions which require investigation.

Diabetes Innocens.

The first question for consideration is the following: Does glycosuria ever occur as a harmless or innocent condition, in no way associated with the disease we call diabetes and therefore of favourable prognosis? We know, of course, that glycosuria is met with in some well recognized morbid conditions, such as cases of meningitis, of cerebral tumour, of disease of the pituitary gland, in exophthalmic goitre, in gout, malaria, syphilis and in pregnancy and lactation. But in most of these conditions the glycosuria is only one symptom and unless the patient presents other symptoms of diabetes we do not regard his condition as an example of this disease. Apart from these easily recognizable morbid conditions, we find in a small number of persons who present no other signs of disease of any kind and appear to be perfectly healthy, a constant excretion of a small quantity of sugar sufficient to be detected by the ordinary clinical tests. Different observers have recorded groups of cases of this nature which do not in all respects correspond with one another, and this very variation would seem to indicate that there is some hereditary or congenital defect responsible for the glycosuria. Thus Graham quotes three cases described by Weiland, one by Garrod, nine by Salomon and three by Riesman. The ages of these patients varied from six to thirty or forty years and as the sugar was only discovered by accident, it is probable that it had been excreted for some years. The amount of sugar was very small, less than ten grammes per day and this

amount bore very little relation to the amount of sugar eaten, for a dose of one hundred grammes of sugar only caused an excretion of two to ten grammes of sugar. In these cases the amount of sugar in the blood lay within normal limits, no symptoms could be attributed to the glycosuria and the condition remained stationary. These cases seem to form a definite clinical entity and bear no relation whatever to the disease we call *diabetes mellitus*. They have been called *diabetes innocens*. But there is another group of cases recorded by Garrod, Parkes Weber, Lewis and Mosenthal which resemble those described above in that the level of the blood sugar is within normal limits, but they differ in that the amount of sugar excreted in the urine is not quite independent of the amount of sugar ingested. They must still be regarded as belonging to the group of *diabetes innocens*.

The mechanism by which the sugar escapes through the kidney into the urine is not clearly understood; it may be passively excreted through the renal epithelium or actively excreted by the renal epithelium. In some instances the fact that an increased excretion of sugar takes place when the level of the blood sugar is raised after a meal suggests that a definite leakage of sugar takes place; but the further fact that the increased output of sugar continues for some time after the blood sugar has fallen to its normal level suggests rather that there is not a passive leakage but an active secretion of sugar going on even after the blood sugar has fallen to its normal level. Moreover, it has been shown that the relation between the level of the blood sugar and the amount of sugar excreted in the urine is not a simple one, for cases have been recorded in which the level of the blood sugar has been considerably raised without any glycosuria occurring. It appears quite clear that there are cases in which the threshold for the excretion of sugar by the kidney is lowered as a result of some congenital defect in the physiological activity of the renal epithelium. While this condition cannot exclude the possibility of true diabetes developing in such a patient, if the ætiological factors of true diabetes come into play later on, yet so far as these patients have been observed the excretion of sugar remains stationary and no ill-effects have been observed even for years after the discovery of the sugar in the urine. There does not appear to be any derangement of the carbo-hydrate metabolism, nor any disturbance of the pancreatic or other internal secretions. There may be some faulty metabolism, such as gives rise to cystinuria or alkaptonuria, or it may be due simply to some irregularity in the excretory function of the kidney.

Renal Diabetes.

Apart, however, from these cases of what is called *diabetes innocens* patients suffering from definite nephritis are found sometimes to have glycosuria in addition to urinary signs of chronic inflammation of the kidneys. In this class of case there can be no difficulty in deciding that the sugar excretion is due to the defect in renal function dependent on the structural change in the kidneys. The condition in

these patients is sometimes spoken of as renal diabetes, although this latter term is now also applied to the *diabetes innocens* group. It is obviously of great importance to arrive at a correct diagnosis of these conditions of innocent or harmless or negligible glycosuria and I shall defer the consideration of this point until later on.

Glycosuria Antecedent to Diabetes.

The next question we may ask is: Does glycosuria due to some accidental condition ever occur as an antecedent to the development of true *diabetes mellitus*? Or does glycosuria predispose to the development of diabetes? This is, perhaps, a very difficult question to answer. We do know that glycosuria may develop in some persons as a result of excessive consumption of sugar or alcohol. It may appear in the course of pregnancy or lactation and disappear when those events are over. Again it may result from some accident or injury. But not every person who is subjected to these conditions, develops glycosuria and we must suppose that in those who do so, there is either a constitutional disposition leading to a diminished capacity to utilize a larger amount of sugar in the blood than is normally present or there is a lowered threshold in the kidney for the excretion of sugar. If these possibilities are present in any individual, then there is probably a greater tendency for such person to pass into a condition of permanent diabetes. There is no doubt that cases do occur in which there is a condition of permanent glycosuria without the other ordinary clinical symptoms of diabetes. Nearly thirty years ago I attended a man about forty years of age whose father had had diabetes. I found his urine loaded with sugar and the quantity passed was several litres in the twenty-four hours. This patient was intemperate both in eating and drinking and although he appeared to make some effort to control his appetite, I do not think he was very successful in either abstaining from alcohol or in restricting his diet to non-carbohydrate foods. I watched this patient up to the time of his death a few years ago and his urine always contained a large amount of sugar and in recent years a fairly large amount of albumin as well. He suffered periodically from severe attacks of asthma and rarely got more than two or three hours' sleep. Nearly twenty years ago he had an attack of acute nephritis in London and his life was despaired of by three eminent London physicians. He recovered to all appearances completely except for the presence of albumin in the urine which, however, only appeared within the last few years of his life. Some years ago he had a bad attack of broncho-pneumonia and this along with his asthma prevented him from lying down in bed. He used to sleep with his arms hanging over the back of a chair and as a result he developed peripheral neuritis in both arms. This was not accompanied by much pain, but he had a condition of wrist drop for some weeks. He completely recovered from this trouble, continued to drink a large amount of alcohol and finally died from heart failure without developing any signs or symptoms of diabetes ex-

cept the glycosuria. I presume that in this patient the glycosuria was due to the excessive alcohol and although it had existed for many years it did not develop into a *diabetes mellitus*.

Diagnosis of Diabetes Mellitus.

This leads us now to consider what are the special symptoms which we rely upon for a diagnosis of *diabetes mellitus*. The first and most prominent is polyuria with more or less constant excretion of sugar in the urine, associated generally with excessive thirst and ravenous appetite. It is commonly stated that the sugar acts as a diuretic leading to the excessive secretion of urine and the draining away of the large amount of fluid demands the intake of a large amount of water. Other striking features are progressive emaciation, dry skin with tendency to eczematous eruptions, progressive weakness and sense of weariness, neuritic pains and loss of the knee jerks. What are the causes of the development of these symptoms?

Ætiology of Diabetes Mellitus.

If we refer to the ætiology of *diabetes mellitus* as laid down in the text-books we find a great number of factors set forth, but they may be generally classified under two heads, physical and mental or nervous. The physical causes include a variety of infective diseases and toxic conditions which appear to act detrimentally on the liver and pancreas and so lead to disturbance of the carbo-hydrate metabolism. The connexion of mental or nervous factors in the development of diabetes may not be so obvious at first sight, but of the existence of such a connexion there can be no doubt. I will briefly refer to three cases of this nature which have come under my observation. The first case was that of a university teacher, about twenty-eight years of age, who had always had good health. One afternoon on returning from an expedition in a sailing boat he was struck on the head by the boom of the sail. Although he felt stunned, he was not rendered unconscious. Next day he complained of some sensation of fullness in the head which continued for a few days. Very shortly afterwards he began to pass a larger quantity of urine than he usually did and at the same time began to suffer from excessive thirst. He consulted a doctor who discovered that he had glycosuria. This discovery gave him a great shock as he was engaged to be married. He learnt how to test his own urine for sugar and did this test nearly every day, with the result that he worried greatly if he found the reaction for sugar more pronounced on one day than on another. In spite of careful dieting and treatment he rapidly lost weight and died within eighteen months with all the symptoms of coma.

A second case was that of a young man of about twenty-four years of age who set out with a party of friends in a sailing boat from Fremantle. They were going out camping at a spot some distance along the coast and when a short time out were overtaken with very bad weather and were in imminent danger of being driven on the rocks. However, they managed to escape and arrived safely at their destination. Very shortly afterwards this

young man began to suffer from the symptoms of diabetes and he, too, in spite of all efforts, gradually wasted and died in coma within a couple of years of the onset of the disease.

A third case is that of a boy of about sixteen years of age whose history I referred to in my presidential address to the Section of Medicine at the Congress in Melbourne in 1908. This boy was passionately devoted to his mother who had had an operation for cancer of the breast. Recurrence took place and further operation was not undertaken. Consequently the boy saw his mother getting weaker each day. Owing to the development of symptoms his urine was examined and found to be loaded with sugar. In spite of every effort this boy got steadily worse and died a fortnight after his mother. After his death they discovered in his room a large number of cuttings from newspapers about cancer. There is no doubt that his mind was always fixed on his mother's illness and the fear of her early death.

I may say that these cases all occurred before the starvation treatment of diabetes had been introduced, so that it is impossible to say what the progress of them might have been under present day methods. But I mention them now to emphasize the influence of mental and nervous strain, not only in the development, but also in the maintenance of the symptoms of diabetes. And in passing I would here enter a strong protest against the practice which I see advocated frequently, of teaching diabetic patients to test their own urine, so that they may be able to regulate their diet themselves according to the presence or absence of the sugar reaction. I believe such a procedure to be highly prejudicial to the patient and one calculated to intensify the mental and nervous depression from which so many diabetics suffer.

Now the one factor which is common to all these patients, is severe emotional strain and stress and we know that this influence acts through the sympathetic nervous system upon the endocrine glands. We also know that the endocrine glands are so intimately associated in some way with one another that a disturbance of one almost invariably leads to disturbed function in one or more of the others. It had long been supposed that there was an internal as well as an external secretion of the pancreas, though there was much dispute as to whether the internal secretion of the pancreas is formed in the special islets of gland cells called the islands of Langerhans. It is remarkable that divergent views are still held as to the nature of these structures, some maintaining that they constitute a distinct structure, others that they cannot be differentiated from the other pancreatic cells. It was in 1893 that these islands were first considered to be the site of the formation of the internal secretion of the pancreas by Laguesse and Schafer and later on Opie strongly supported this view. Other pathologists and histologists, however, have asserted that there is no difference in histological structure between the islands of Langerhans and the rest of the pancreas. An isolated observation recorded by Dubreuil and

Andérodias,⁽³⁾ two Belgian pathologists, seems to support the view of the special structure and function of these islands. A woman, aged thirty-two years, in the eighth month of her fourth pregnancy developed definite glycosuria, passing as much fifty grammes of sugar to the litre of urine. Labour was induced at the beginning of the ninth month and the patient was delivered of a very large child which only lived a few minutes. Histological examination of the pancreas revealed an enormous enlargement of the islands of Langerhans and this was remarkable inasmuch as in normal infants it requires a considerable amount of searching to find them. The islands in this case were very large compact epithelial cell masses which were probably twenty to thirty times the size of the normal islands. The authors suggest that this hypertrophy of the islands was an effort to supply a large amount of glycolytic ferment to destroy the excess of blood sugar which was supplied by the glycosuric mother in the placental blood. Whether this theory be correct or not, this observation at least tends to support strongly the view that the islands of Langerhans have some difference in function, if not marked difference in histological structure from the rest of the pancreas.

Sir Charles Sherrington⁽⁴⁾ in his presidential address to the Royal Society of London, referring to this question suggests that the previous failures to effect much improvement in diabetic conditions by the use of pancreatic extracts might be due to the digestive secretion of the pancreatic cells destroying the special ferment secreted by the islands of Langerhans. The more recent work of Banting and Best, of Toronto,⁽⁵⁾ who appear to have been successful in isolating the special ferment from the islands of Langerhans, seems to bear out the truth of this statement. The starting point of this recent work was the utilization of the well known experimental fact that the cells of the pancreas which secrete the digestive enzymes, become completely degenerated in about six weeks after ligation of the pancreatic ducts, whereas those of the islands of Langerhans which apparently form the special internal secretion, remain more or less intact. By acting on this fact the Canadian observers were able to secure an extract of the islands of Langerhans unaffected by the ordinary pancreatic secretion and, so far as our information goes at present, this internal secretion called "Insulin," has been most effective in preventing the development of diabetic symptoms in de-pancreatized dogs and in alleviating the symptoms of diabetes in man.

This work, therefore, tends to uphold the view that there is a special internal secretion of the pancreas whose action appears to be normally concerned in controlling the blood sugar in health, for its injection is followed by a rapid lessening of the percentage of the blood sugar in normal animals. This is a fact of the utmost importance in considering the cause or causes of the development of *diabetes mellitus*, for it would appear to support the view of some pathologists that diabetes is a disease of the pancreas resulting in a deficiency

of its internal secretion and in the general inability of the system to utilize glucose. Allen, for example, states that "it is now sufficiently established that the normal cause of diabetes is pancreatitis," although he admits that the disease may reach a fatal issue and yet the pancreas be as good as normal. But if organic disease of the pancreas be the cause of diabetes we should surely expect to get some other symptoms of pancreatic disease besides the glycosuria, such as an excess of unsplit fat in the stools, a high diastase content in the urine and the dilatation of the pupil after the instillation of adrenalin. If results of these three tests were positive, then we might be quite confident in diagnosing pancreatic disease as the cause of the glycosuria; but it must be admitted that in the vast majority of cases of diabetes these signs are absent and any disease of the pancreas in diabetes must be confined strictly to the islands of Langerhans.

Now although failure of the tissues to utilize carbo-hydrates and the discharge of excess of sugar in the urine are the outstanding features of *diabetes mellitus*, we have to remember that there is also in some cases at any rate a failure of protein and fat metabolism and we find acetone, diacetic acid and oxybutyric acid in the urine. Labbé,⁽⁶⁾ of Paris, has used this fact as a basis of division of cases of *diabetes mellitus* into two classes. The first class comprises diabetes without "nitrogen denutrition," in which there is only difficulty of carbo-hydrate metabolism. The glycosuria is moderate in amount and varies with the carbo-hydrate intake, but the daily loss of sugar in the urine is always less than the quantity of carbo-hydrates taken. The second class includes cases with "nitrogen denutrition," where the failure of carbo-hydrate metabolism is associated with failure of protein and fat metabolism, representing the gravest factor in the case. In these cases the quantity of sugar excreted is greater than that of the carbo-hydrate ingested, the excess is provided by protein and fat metabolism.

These observations appear to have a good deal of support from clinical experience, but we have to remember that previous to the introduction of the modern methods of treatment of diabetes by fasting and reduced diet it was customary to administer large amounts of protein and fatty food to compensate for the deficiency of carbo-hydrates in the diet and the medical practitioner aimed not only at keeping up the nutrition of the patient, but also at getting the patient to put on weight. The addition of these large amounts of protein and fat in the diet must add to the difficulty of the diabetic and tend to cause the formation of imperfectly oxidized and toxic substances in the tissues and their excretion by the kidneys, for a deficiency in carbo-hydrate combustion impairs the combustion of fats. It is, I believe, a fact that under the fasting treatment and the low caloric value aimed at in the subsequent diet the occurrence of the acetone bodies in the urine is much less common than under the former method of treatment. Still the fact remains that in some cases of diabetes all attempts to improve the patient by attention to the carbo-hydrate metabolism alone results in failure. In fact the

fasting treatment if too frequently repeated or too much prolonged seems to aggravate the condition by augmenting waste and hastens the end.

Another matter which requires some consideration, is the relation of many of the so-called complications of diabetes to the condition of hyperglycæmia and glycosuria which occurs in this disease. Are all these morbid conditions such as cataract, diabetic neuro-retinitis, neuritis, gangrene, carbuncle *et cetera* to be attributed to the circulation of blood containing an excess of sugar? Dr. Langdon Brown⁽⁷⁾ in a lecture on the relation of diabetes to the ductless glands, says: "Apparently 0.1% is the optimum blood sugar content. This amount is carried in combination, whereas the sugar in excess of this amount is in simple solution. To carry an excess of crystalloid sugar in simple solution has certain definite drawbacks, for it alters the osmotic pressure of the body fluids which may, for instance, damage the translucency of the crystalline lens, or it may infiltrate the nerves causing interstitial neuritis and provide a pabulum for septic organisms, producing boils and carbuncles. All these may be the direct result of hyperglycæmia."

While this is probably true to a large extent, we must remember that glycosuria may be due to the absorption of sapræmic products from a focus such as a carbuncle or a gangrenous extremity and the removal of the septic focus may result in the disappearance of the glycosuria.

In regard to a case of gangrene of the foot with sugar in the urine successfully treated by amputation, Sir Cuthbert Wallace says: "It occasionally happens that after amputation the sugar disappears or is greatly diminished in amount and this seems to suggest that it is possible that the gangrene may cause the excretion of sugar possibly through the absorption of septic products." In a later paper the same author elaborates the theory of transient glycosuria dependent on septic absorption in cases of gangrene, carcinoma of the rectum, erysipelas, lymphangitis and carbuncle.

Now these facts clearly indicate that the clinical differentiation between glycosuria and *diabetes mellitus* is a matter of extreme importance and the failure to recognize clearly this distinction is apparently responsible to some extent for the directly opposite opinions advanced as to the desirability or not of operation in patients with glycosuria. We know that in patients suffering from *diabetes mellitus* the tissues are supplied with blood containing excess of sugar in a crystalloid form and that they must, therefore, be more vulnerable to trauma of any kind—a vulnerability which cannot be overcome by the most scrupulous care in the practice of antiseptic or aseptic surgery. But if the glycosuria be due to a lowering of the saturation point of the blood for sugar dependent upon some disturbance of the function of the liver, the removal of the focus from which the septic products depressing the glycogenic function of the liver are being absorbed, will result, if the condition is not too advanced, in the restoration of the liver function in raising the saturation point of the blood for sugar and the disappearance of the glycosuria.

It appears to me, therefore, of the utmost importance to recognize that *diabetes mellitus* is not what is sometimes called a "clinical entity," that when we have discovered sugar in the urine we have not by any means done all that is necessary to arrive at a diagnosis of diabetes. In fact it may be a matter of extreme difficulty in some cases to decide (until the patient has been under observation and treatment for some time) whether the patient's glycosuria is negligible or whether it is due to a failure of the pancreatic internal secretion and therefore according to our present day knowledge amenable to treatment, or whether it is one of those more severe cases in which there may not only be a failure of the internal pancreatic secretion and consequent overloading of the blood with sugar, but a coincident failure in protein and fat metabolism, indicating a much more serious and profound change in the body tissues which will invariably prove fatal in spite of all our efforts at treatment.

Differentiation Between Glycosuria and Diabetes Mellitus.

How then are we to proceed in any particular case in endeavouring to arrive at an accurate diagnosis between harmless glycosuria and *diabetes mellitus*? First of all we must investigate the family and past history of the patient. We must, however, remember that a history of "diabetes" in the family cannot be considered of weight unless there is definite proof that the condition was true diabetes and not merely glycosuria. This information may be very difficult to get. Harmless glycosuria or *diabetes innocens* is not infrequently found to run in families.

Then we must make an exhaustive clinical examination of the patient for symptoms, such as excessive thirst and appetite, polyuria, constipation, wasting, weakness and aching pains in the limbs, especially in the calves of the legs. We must also examine the patient for signs of neuritis, absence of reflexes, skin eruptions, cataract and neuro-retinitis *et cetera*. Special attention should also be paid to the tests for pancreatic disease, the presence of unsplit fat in the stools, the excess of diastase in the urine and the adrenalin test in the eye. If these tests should reveal the presence of pancreatic disease, we may reasonably conclude that the glycosuria is due to this disease and that there is a disturbance in the supply of the internal secretion of the pancreas. If, however, no result is obtained from all these tests, as happens in many instances, then we are compelled to fall back on certain clinical chemical tests of the urine and the blood. We must estimate the amount of urine and the percentage of sugar present in the urine when the patient is put on a full ordinary diet. Then after two or three days the patient is put on a very restricted carbo-hydrate diet and then put on starvation diet. The quantity of urine and the amount of sugar must be carefully estimated each day until it disappears from the urine. By this method we may be able to arrive at a provisional diagnosis that the patient is suffering from a form of glycosuria which can be controlled, at any rate

temporarily by restriction of diet to starvation point, but it will not help us to differentiate between a *diabetes innocens* and a true *diabetes mellitus*.

In view of our present knowledge of what is called sugar tolerance the estimation of this in any case of glycosuria is essential to enable us to arrive at a definite diagnosis whether the patient is suffering from a harmless glycosuria or from the disease *diabetes mellitus*.

To enable us to understand the significance of sugar tolerance it is necessary to know the conditions met with in normal healthy persons and then compare these results with those obtained from persons suffering from glycosuria. I have already pointed out that there is no necessary relation between the amount of sugar excreted in the urine and the percentage of blood sugar. The latter may be within normal limits and yet the patient pass sugar in the urine owing to a lowering of the threshold for sugar excretion in the kidney. On the other hand the percentage of sugar in the blood may be very high and yet no glycosuria appear, because the threshold for the excretion of sugar has been raised so as to conserve valuable food material in the body. But it is found that after the ingestion of varying amounts of sugar the percentage of sugar in the blood after a certain period of time has elapsed will vary with the condition of the patient, that is with the patient's capacity for dealing with an extra amount of sugar in the blood.

In testing a patient for carbo-hydrate tolerance it is not found to be necessary to starve the patient, but only to allow sufficient time to elapse after the last meal to ensure the return of the percentage of blood sugar to normal. Then a certain amount of sugar is administered and examination of the blood undertaken at intervals to ascertain the percentage of sugar in it. In doubtful cases fifty grammes of glucose elicit an adequate response, but in studying the reaction of definite diabetics a considerably smaller dose is often used.

This method of procedure enables us to gain an insight into the patient's capacity for dealing with carbo-hydrates more certainly and more rapidly than a dietetic test, in which the appearance or absence of glycosuria is also to be considered, for even glycosuria is in itself no evidence of hyperglycemia unless the renal threshold for sugar is known. A study of the blood sugar in diabetes suggests that in the diabetic a failure of some mechanism by which in health sugar is abstracted from the blood and stored is an important, if not the most important defect.

Conclusion.

In conclusion I have been endeavouring to bring before you the most recent researches on this important subject and I think you will agree with me that a considerable amount of light has been thrown upon what has been in the past a dark corner in clinical medicine. But it is obvious that if we are moved to take advantage of these newer methods of diagnosis, we must have facilities for the carrying out of these investigations. Now the general

practitioner is not only not capable in many cases of carrying out these tests, but he has not the time required to do it. So it must come to the establishment of clinical laboratories or the recognition of special clinical bio-chemists who will be prepared to undertake these investigations for the benefit of the profession at large. Clearly if our work is to improve and our diagnosis and treatment to be more in accordance with modern scientific advancement, there must be facilities afforded for all classes of practitioners to get these results.

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RETRO-DISPLACEMENT OF THE UTERUS AND ITS TREATMENT.¹

By HERBERT H. SCHLINK, M.B., Ch.M. (Sydney),
Honorary Gynaecological Surgeon, Royal Prince Alfred
Hospital, Camperdown, Sydney.

WHEN YOUR Association paid me the honour of an invitation to address you at Port Macquarie, I felt that I could select no more useful subject than the common and much mishandled complaint of retro-displacement of the uterus and the principles of its treatment as practised at the Royal Prince Alfred Hospital during the past twenty years.

This subject cannot be entirely dissociated from prolapsus or hernia of the pelvic floor as in many cases it is simply the early stage of a complete or incomplete procidentia, seeing that the uterus follows the axis of the pelvis in its descent. Thus, about the level of the brim or just below it (its normal position) it is anteverted, but in the cavity when prolapse is commencing it lies retroverted. Moreover, the vast majority of retro-displacements and prolapses have a common cause in the puerperal condition or rather in the non-return to normal during the puerperium of the supports of the uterus which have been injured in labour. Still, it would be impossible to cover the whole ground in one paper, so today we will confine our attention to retro-displacement, touching only those aspects of prolapse that have a bearing on the early stages of the latter's development.

¹ Read at a meeting of the Eastern Districts Medical Association, Port Macquarie, on September 22, 1923.

ANATOMY.

Before developing this subject we must briefly consider what are the structures that hold the uterus in its normal position of anteversion or rather by what factors it is prevented ordinarily from going beyond certain limits, but permitted free movement within those limits.

This subject has given rise to prolific discussion and has inspired an enormous literature which has advanced us through three distinct phases to our present knowledge.

At first it was considered that the uterus maintained its normal position with its limited range of movement, solely by four sets of ligaments—the utero-vesical and round ligaments in front, the utero-sacral behind and the broad ligaments laterally.

The second phase proved the value of the pelvic diaphragm, *id est* the *levator ani* and their associated muscles and fascial coverings as the essential factors in keeping the uterus in place.

The third phase showed that there were still essential supports that had been hitherto neglected in the consideration of this question, namely those lying in the space between the muscular diaphragm below and the covering peritoneal ligaments above. These intervening supports consist of the fascia and connective tissue surrounding and attached to the uterus, cervix and vagina and the fascial coverings of rectum and bladder which constitute the fascia proper of these organs and are merely en-sheathing prolongations from the parietal pelvic fascia. Round the blood vessels, nerves, lymphatics and ureters this tissue is especially condensed in the form of sheaths which run from the side wall of the pelvis to pierce the uterus, cervix and vagina and constitute the real support of these organs. That surrounding the uterine vessels is especially condensed and given the name of *ligamentum colli* or transverse cervical ligament. The existence of this ligament and the important part it plays in the support of the uterus are well demonstrated in the course of the operation of vaginal hysterectomy. Few probably have seen many of these operations in Australia, but they are quite common on the Continent. If you watch this operation being performed, you will observe the great difficulty the operator has in pulling down the cervix very far until the uterine vessels have been divided and along with them the so-called transverse cervical ligament. Nor has the importance of the ureters and their fascial sheaths been sufficiently

noticed in the past for their assistance in maintaining the uterus and vagina in position. When doing a Wertheim's operation for radical removal the operator is struck by the way these tough ureteral strings are attached to the posterior layer of the broad ligament and the dense ureteral canal through which they pass as they run under the uterine arteries to their place of implantation in the bladder. They resemble two cables of a suspension bridge, attached to the kidney and peritoneum of the side wall of the pelvis and posterior layer of broad ligament above and the bladder below which in turn is stabilized by its fascia. Between these two pillars the uterus is suspended as it were by the ureters passing through the attached ureteral canals and enshrouding prolongations of fascia above and below. The pubo-cervical ligaments under the bladder are also a reality and not a myth. Thus, to recapitulate the factors that assist in maintaining the uterus within normal

limits or rather assist in preventing its remaining permanently beyond the normal limits are: (i.) The covering peritoneal ligaments above; (ii.) the supporting muscular diaphragm below and (iii.) the fascial sheaths, vascular, ureteral, vesical and rectal between these two.

An additional factor in maintaining the uterus in the anterior position is intra-abdominal pressure, but this is a double-barrelled gun and might easily exert its influence in the opposite direction.

Further, the normal weight and size of the uterus may be regarded as a kind of passive or negative factor, as it is only when it increases in weight or size that it

enters as an active factor in displacements.

ÆTIOLOGY.

The congenital retro-displacements must be regarded as normal for those patients, as the organs have grown in that position. Apart from these, the aetiology can be found as: (i.) Failure of one or all of the three sets of support just described, due usually to childbirth or miscarriage; (ii.) increase in size or weight of uterus, *id est* uterine tumours or subinvolved uterus *et cetera*; (iii.) constant or sudden pressure or traction from without, push or pull as it were, *id est* ovarian tumour, adhesions, inflamed appendages, over distended bladder with sudden increase of intra-abdominal pressure *et cetera* or a combination of two or all three of these factors.

For all practical purposes retro-displacement may be due to either puerperal or non-puerperal causes

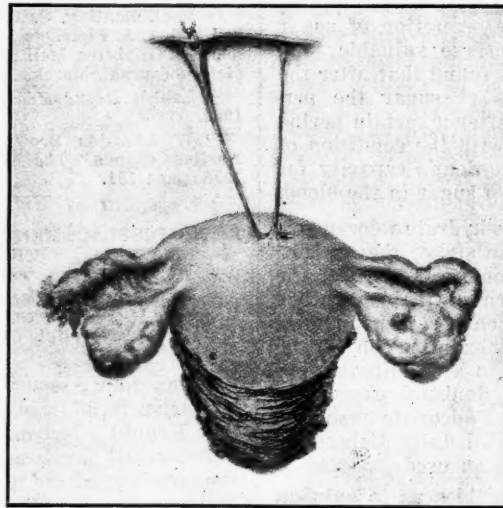


FIGURE I.
Illustrating False Ligaments found in the Majority of
Instances after Ventro-Suspension or Fixation (after
Kelly).

and if a careful history be taken, it will be found that 80%, whether complicated or uncomplicated, can be traced back either to a miscarriage or childbirth. Of those due to non-puerperal causes 10% are accounted for by tumours or adhesions and 10% are congenital.

TREATMENT.

Prophylaxis.

Prophylaxis, of course, in the main means good midwifery, conservatism in treatment, allowing the patient her own time and judicious use of the forceps. It implies thorough asepsis to prevent that excessive softening that accompanies puerperal infection. Careful approximation of any torn muscles or fascial sheaths of the pelvic diaphragm; posturing the patient during the puerperium and avoiding the continuous dorsal position; preventing the patient getting up too early and even the temporary use of a pessary after the third week.

In the case of miscarriages it means a thorough emptying of the uterus and prompt replacement of that organ afterwards and even the temporary use of a pessary for some weeks. Also, in any instrumental examination that requires the dragging down of the uterus with a volsellum, care should be exercised always to replace the organ after the conclusion of the examination. Again when removing gauze from the uterus after curettage, two fingers of the left hand should be implanted against the anterior lip before any pull is exerted on the gauze. Lastly, all conditions tending to increase the intra-abdominal pressure such as strenuous athletic exercise should be guarded against during the over distension of the bladder or rectum. Almost every practitioner has met with those acute cases of retroversion in young girls who from feelings of embarrassment when in mixed company refrain from emptying a full bladder. For example, while making an extra severe service when playing tennis they suddenly get a sharp pain in the back and a feeling of nausea. The uterus being tilted back by the full bladder the diaphragm fixed for the supreme effort the intra-abdominal pressure comes falling like a ton of bricks on the anterior surface of the uterus and *presto* the uterus shoots back like an umbrella that the wind has caught on the wrong side. This leads me to assert that many of the more strenuous games are not suitable for the future mothers of the community.

Conservative Neglect.

Congenital cases should usually be left alone as the uterus has grown in a position which is the natural one for the patient. A uterus, bound down by adhesions which are giving no symptoms, should be left alone unless we are prepared to open up and break down the adhesions before bringing the uterus forward.

Cases of simple or uncomplicated retro-displacement naturally fall into two classes, those that give symptoms and those that do not. The latter do not call for any treatment and, if discovered in the course of treatment, it is as well not to rivet the attention of the patient on the condition. For protection tell her if you like, so that another man does not get one over, but explain that at present it is of no importance. So many men, too lazy to go into these cases thoroughly, are only too ready like a drowning man to grab at anything and put

the entire blame on the unoffending retro-displacement. Anæmia is often responsible for the bleeding, errors of refraction for the headache, disturbances of the alimentary canal or renal tract for the backache, stenosis of the cervical canal for sterility, the central nervous system for dysmenorrhœa, inflammation of the bladder for bearing down pain and so forth. Only in half these simple or uncomplicated cases are the symptoms due to the mechanical position of the uterus. Therefore, it behoves us if we desire cures, to investigate every other avenue of pain before finally placing the responsibility on the displacement.

The watchword is conservative neglect in these uncomplicated cases, if there are no real symptoms arising from them.

Even when conception takes place, the majority of uteri right themselves and at the worst only require lifting up manually and the temporary use of a pessary until the fourth month.

Non-Operative Treatment.

Having thoroughly gone into the history and decided that active treatment is necessary, you must undertake reposition of the uterus and its retention in proper position by a pessary or by operation. To my mind, there are only two types of patient in whose treatment the pessary has a legitimate permanent use: (i.) Old people nearing their term of life and patients unable to withstand operation through some physical defect of the heart, lungs *et cetera*; (ii.) patients who absolutely refuse operation. There is a third class that requires its

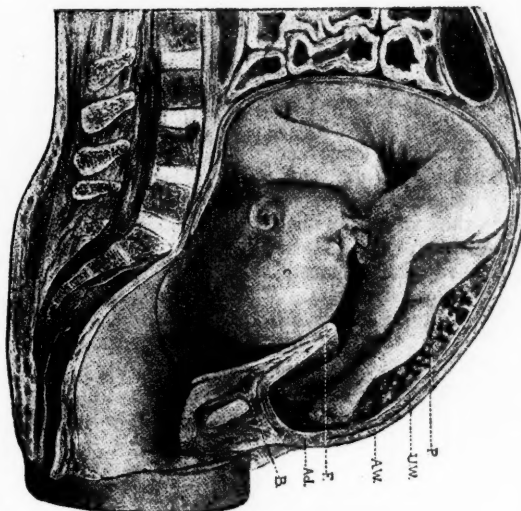


FIGURE II.
Illustrating Malposition of the Fœtus Created by Vento-Fixation (after Newell). A.W. = Abdominal wall; U.W. = Uterine wall; Ad. = Adhesion between uterus and anterior abdominal wall; B. = bladder; P. = Anterior abdominal wall folded; P. = placenta.

temporary use—those suffering from retroverted pregnant uterus and those left with a retroverted uterus after childbirth. Both types have been dealt with under other headings.

The Hodge pessary, the Albert Smith and the watch-spring pessaries are the only ones necessary in a gynaecologist's outfit. Preferably the first two should be of vulcanite and the third of hard rubber with or without a glycerine cushion. It is unnecessary to warn old seasoned practitioners regarding the scrupulous cleanliness required and if this is carried out, pessaries should give no more trouble than a vulcanite tooth plate in the mouth.

Operative Treatment.

There is no aspect of the question of operative treatment that has given rise to such a diversity of opinion and such a variety of technique. Something over a hundred different operations have been devised for the correction of this condition, but be not afraid. It is not my intention to try and bore you with procedures most of which are unsound in principle and planned regardless of anatomical facts. All operations for retro-displacement can be classified under three headings: (i.) Vaginal fixation, (ii.) ventral suspension or fixation, (iii.) shortening and fixation of the round ligaments.

Vaginal Fixation.

In vaginal fixation operations the anterior surface of the uterus is stitched to the anterior vaginal wall or to peritoneum covering the bladder. The operation is usually performed by the vaginal route through an incision in the anterior fornix. These operations were once much favoured in Germany, but they are now discarded. Franz Strassmann, Bumm, Schroeder, Döderlein and others have all discarded them, but Mackenrodt, of Bandler Strasse, still practises it exclusively where there is any degree of prolapse accompanying the retro-displacement. He always does a preliminary amputation of the cervix before fixing the uterus to the vaginal wall below the bladder and he told me that the unsatisfactory results obtained by others performing his operation were due to neglect of this detail. He assured me that there was no difficulty with future childbirth. However, these operations have never been popular outside Germany and they are largely given up there.

I must admit that Mackenrodt's operation of interposition as performed by himself looked a very suitable one for those patients that have considerable prolapse of the bladder accompanying the retro-displacement. Generally speaking, I would not recommend operations of this class.

Ventro-Suspension or Fixation.

Olshausen, of Berlin, and Howard Kelly, of Baltimore, the originators of ventro-suspension or fixation, have a lot to answer for on account of the wide publicity they gave this dreadful creation of their brains. Notwithstanding the many world renowned surgeons who practise this operation, I have no hesitation in stating from my own personal experiences that these operations should never be practised on any woman during the child-bearing period. Their use should

be confined to those instances in which the uterus tends to fall back after both tubes have been removed for pyo-salpingitis or some other disease. No uterus, likely to become pregnant, should ever be fixed forward by this method which flies in the face of every anatomical consideration, causes so much suffering and requires so many second operations for the complications that follow in its path (see Figure I.). The procedure became popular on account of its ease of accomplishment and the little time taken to execute it. Again, I repeat that except as a part of a sterilizing operation it should never be performed. Advocates of this method claim that it makes no difference to pregnancy. Well, they very rarely see the next labour and the complications are usually seen by others (see Figure II.).

While passing through Melbourne quite recently, an honorary surgeon of one of the hospitals told me of four fatal cases, the result of ventro-suspension—obstruction with gangrene of the bowel, a ruptured pregnant uterus and two cases of dystocia.

Even granting that a considerable number of women who have had suspension or fixation done, pass through future pregnancies with ease and comfort, an operation that is followed by so many complications and even fatalities, should be discarded.

Shortening and Fixation of the Round Ligaments.

Fortunately, most authorities now agree that instead of depending on adhesions it is far better to make use of a natural structure to suspend the uterus. And though the round ligament has only a minor rôle in keeping the normal uterus in position, it has proved of great service to the operating gynaecologist in restoring a displaced uterus to position. In point of fact, all operations of any use in this complaint depend on shortening and fixing these ligaments. Operations on the round ligaments may be roughly divided into two classes: (i.) Those that on completion of the operation depend on the thin inguinal part of the round ligament to support the uterus, *id est* Webster Blady sling operation, Dudley technique or Wyllie procedure *et cetera*; (ii.) those that depend on the strong uterine portion of the round ligament, namely external shortening of the round ligaments through inguinal canal, internal shortening of the round ligaments by Martin and Kelly technique and Gilliam's operation or some modification of it. The first class of operation should be, in my opinion, discontinued and we should entirely depend on the second class of operation as the only dependable means of securing good end results. The best of these in my experience is shortening the round ligaments through the inguinal canal first suggested by Alquié in 1840 and later improved by the two English surgeons Alexander and Adams. This is anatomically sound and when completed depends on the strong uterine end of the ligament to support the uterus. In a long out-patient experience at the Royal Prince Alfred Hospital I have come across no recurrences after this operation had been performed by a competent surgeon.

The other day I met with one patient operated on thirty-seven years ago by the old Alcuie method in which the canal is not opened, and although the patient had had five children subsequent to the operation, the uterus was still held up in good position notwithstanding a ruptured perinaeum and a certain amount of bladder and rectal prolapse. External shortening is eminently suitable for simple uncomplicated cases in women who have not borne children, but unfortunately it is most difficult in this class of case on account of the thinness of the ligaments and the difficulty of finding them. Still with patience, they can always be found. In complicated cases it is still the best method of bringing the uterus forward and if the patient is in good condition after the pelvic adhesions *et cetera* have been attended to, I always shorten externally. To avoid the three scars a transverse incision may be used when no sepsis is present. Time or inflammation may demand other methods of shortening, then internal shortening by Martin and Kelly technique is recommended as it conforms in principle to the Alexander Adams in that it depends on the stout uterine end of the ligament when the operation is complete. Lastly, there are some few patients suitable for Gilliam's or some modification of this operation. Only those patients that have a wide salpingo-ligamentous angle should be selected for the operation. Otherwise, as the ligament which is caught at its mid point is drawn through the abdominal wall, it will kink the tube into a hairpin bend and may at times draw it up into the abdominal wall. Every surgeon of considerable experience has had to reopen for such accidents. Thus, to my mind the only operative methods suitable for retro-displacement are: (i.) External shortening and fixation of round ligaments with or without laparotomy for examination of the pelvis; (ii.) internal shortening of the round ligaments by Martin-Kelly technique; (iii.) Gilliam's operation or some modification of it when there is a wide salpingo-ligamentous angle.

Personally, the first is preferred. The second, I can recommend where the first cannot be done as my experience of it runs over nine years and I have watched many subsequent pregnancies in my patients. The third has never been popular in the Royal Prince Alfred Hospital, but in selected cases it is a sound operation.

It is unnecessary to add that in *multipara* with relaxed or torn muscular diaphragms perineorrhaphy with union of the anterior borders of the *levator ani* and their accompanying fascial sheaths must always be attended to before shortening the upper supports.

MEDICO-LEGAL NOTE ON CUT-THROAT.

By J. ALBERT GOLDSMID, M.B. (Sydney),
Murwillumbah, New South Wales.

THE difficulty attending an expression of opinion as to whether a given case of cut-throat is suicidal or homicidal is often very great. The authorities

on medical jurisprudence recognize this and attempt to lay down criteria to assist the medical man in coming to a decision.

The fact that a wound in the throat is "under-cut" is usually taken to indicate homicide. Taylor says (Fifth Edition, Volume I., page 468): "Homicidal incisions, especially in the throat, are often prolonged below and behind the skin forming the angles of the wound (under-cut is the common term) deeply into the soft parts. Those which are suicidal, rarely possess this character, they terminate gradually in a sharp angle and the skin itself is the furthest point wounded."

The following case shows that suicidal cut-throat may show the "under-cut" above referred to. A man of about forty-five years was found lying prone in a pool of blood, with his left arm outstretched and his right forearm doubled under him. The right hand grasped a razor firmly in his fist, the fingers were flexed and the index finger covered the thumb, holding it down; the razor could be rotated in the fist, but could not be withdrawn without forcing the fingers back.

He was lying in front of a duchess dressing-table, the mirror of which had been deluged with blood to a height of 1.4 metres from the ground. The deceased was 1.7 metres (five feet nine inches) in height.

The wound had been made from left to right and passed obliquely upwards as the incision was completed, so that at its termination the lower part of the right parotid gland was exposed.

The cut had gone through the tissues at the level of the thyreo-hyoid membrane completely severing everything in the middle line back to the spine. There were no less than three cuts on the spinal column, namely one over the middle of the body of the vertebra, one well into the intervertebral disc above and a third cut (not so deep as the other two) into the intervertebral disc below. Both sterno-mastoids were very deeply incised, but the point on which I wish to lay stress, is that the incision into the right sterno-mastoid deeply under cut the skin at the termination of the wound.

It was further remarkable that both common carotids had been wounded; each bore a small oval wound, clean as if made with a "punch," in size equal to a small pea. Both extremities of the wound were jagged, one jag at the left and two at the right. The points of the jags on both sides were towards the middle line.

The circumstances made it quite plain that deceased had stood at the mirror and cut his throat, but the nature of the wound under different conditions might easily have given rise to a suspicion of homicide, because (i.) both common carotids were injured, (ii.) there were three cuts on the spinal column and (iii.) the termination of the wound was "under-cut."

A METHOD OF OPERATING UPON STRANGULATED UMBILICAL HERNIA.

By A. S. VALLACK, M.B., Ch.M.

Honorary Surgeon, Mater Misericordiae Hospital,
North Sydney.

Preliminary Remarks.

For the surgeon I know of no more formidable concatenation than the following: Two o'clock in the morning, a fat woman and a large strangulated ventral hernia.

When the sac is opened his joys may be multiplied by the sight of complicated loculi, adherent viscera and gangrenous gut; whilst the anaesthetist still further increases his delight by his struggles with a cyanosed patient and ounces of regurgitated vomit.

When a general is confronted by an enemy who presents a formidable frontal position, he may sometimes surmount the difficulty by a flank attack. I believe that I have devised an operation that in an analogous way avoids the worst difficulties that are encountered in these cases.

The Operation.

An elliptical incision is made round the hernia. When the sac is large, this incision lies upon the sides of the hernia. Enough skin must be left to allow the edges to come together comfortably without tension. From this incision vertical incisions are made in the skin above and below, for such distance as the surgeon deems advisable. The skin is reflected from the fascia; the best place to begin this is at the vertical incisions, where the skin is most normal. The fascia must be left bare and clean for some distance in every direction; the distance will naturally vary with circumstances.

The next step is to incise carefully fascia and peritoneum on the abdominal side of the neck of the hernia. This incision is continued right round the neck of the sac. This is the key to the operation, the sac being thus detached from the patient, remaining joined to her only by the viscera entering and leaving it.

Towels are laid upon the abdomen and the sac is laid upon them, being lifted as far from the patient as possible. In one instance in which the only content of the sac was a coil of small intestine, I was able to lift it several inches away.

The sac is now isolated by towels. This is important as the bowel may be gangrenous and it is particularly necessary to avoid sepsis in mending the fascia.

The sac is now opened from its abdominal aspect. I find that the best instrument to cut the strangulating neck with is a pair of strong straight scissors, the bowel being protected by the point of the finger.

If the contents of the sac are viable, they are returned to the abdomen, but if the gut is gangrenous the surgeon makes a side to side anastomosis between the entering and emerging pieces of gut, cuts them through and sews up the cut ends. This is the quickest and easiest and therefore in these cases the safest way to deal with the bowel.

The fascia should be repaired by overlapping from above downwards, if possible, but if not it may be done from side to side.

I have operated by this method three times and am satisfied that it makes these operations much easier and safer.

An Illustrative Case.

The condition of the last patient upon whom I operated, was typical of the difficulties and complications likely to be found. A stout woman was sent into the Mater Misericordiae Hospital at night with a large umbilical hernia which had been strangulated for two days.

The sac contained separate loculi. One of these contained strangulated large intestine, the second unstrangulated small intestine and the third the uterus and its adnexa.

The woman had had a ventro-fixation years before and the uterus had been dragged up with the parietal peritoneum into the hernia, naturally it was very adherent.

The operation done by above method was not difficult and the patient did very well.

Concluding Remarks.

I should like to offer comments upon two difficulties liable to be encountered in these cases.

The first is with regard to the viability of gut. I remember once operating upon a patient with strangulated femoral hernia. I stood looking rather stupidly at a piece of strangulated gut, wondering whether I ought to return it or excise it. Suddenly it dawned upon that if I made an incision in the wall of the gut it would bleed if it were still alive. I made an incision into the muscular coat and was pleased to see the blood continue to trickle from it. I wondered how I had been such a fool as not to have thought of it before.

The second point is in regard to the best way of dealing with regurgitant vomiting. When the patient is almost fully anaesthetized, a stomach tube is passed into the stomach. It is then fastened to the cheek of the patient by a towel clip. The other end of the tube hangs into a tub. As soon as the bowel contents are regurgitated into the stomach this tube syphons them off.

I read of this method in *The British Medical Journal* many years ago and have called down blessings on the writer's head on a number of occasions since then.

Reports of Cases.

A CASE OF CONGENITAL ABSENCE OF ONE KIDNEY.

By ROBERT SOUTHEY, M.D., B.S. (Melbourne),
Assistant Pathologist, Children's
Hospital, Melbourne.

Clinical History.

J.H., a male, *etatis* thirteen years, was admitted to hospital on October 10, 1923, with the history of progressive weakness in the legs for the previous six months, during

which time he had suffered from attacks of giddiness and dyspnoea accompanied by sensations of faintness.

According to his mother he had been ill at home for two months before admission with acute nephritis. During that time the urine contained much albumin and was "smoky" in appearance, but no microscopical examination had been made.

Apart from measles in infancy there had been no other illnesses.

Physical Examination.

He was a pasty looking boy, slightly dyspnoic. The heart was not enlarged; a soft systolic bruit was audible at the apex, but not conducted to the axilla. Except for extreme *genu valgum* the remainder of the physical examination revealed nothing unusual. The systolic blood pressure was one hundred and eight millimetres of mercury.

The urine contained a small amount of albumin, but microscopical examination revealed nothing pathological.

Course of Illness.

During the fourteen days following the boy's admission to hospital his general condition greatly improved and he was able to walk about without distress. In fact arrangements had been made for his transfer to the Convalescent Cottage. Suddenly he became worse again; the blood pressure rose to one hundred and forty millimetres of mercury; the urine now contained a large amount of albumin and microscopical examination revealed only few pus cells and bacilli, but an absence of red blood cells and casts.

The patient then lapsed into a uræmic condition and died two days later. Unfortunately the usual renal efficiency tests were not carried out, as until the terminal phase the urinary findings did not reflect the gravity of the illness.

Autopsy.

The body was that of a rather pale boy, fairly well developed but thin.

The heart was not enlarged and showed no abnormality of the valves or septa. There was no endocarditis or pericarditis and the *ductus arteriosus* was completely closed.

The lungs were engorged and exhibited an intense pulmonary oedema, the whole surface on section being very watery and frothy, but there was no pneumonic consolidation. No fluid was present in the pleural or pericardial cavities.

The liver was slightly enlarged and a certain degree of venous engorgement was noted, but no streaking of the capsule and no fibrosis. The spleen was not enlarged; it was somewhat friable and there was no capsulitis.

The gastro-intestinal tract exhibited nothing abnormal. The left kidney was converted into a large hydronephrotic sac. Dilatation of the pelvis and calices was extreme and renal tissue was reduced to a mere remnant. The capsule was adherent and on stripping a finely granular underlying surface was seen. The ureter was dilated and tortuous and connected to the renal pelvis by a very narrow opening, while at its lower end about 1.25 centimetres proximal to the bladder it was considerably narrowed.

On the right side there was no trace of any kidney or ureter and no indication of any ureteric orifice in the bladder, although that for the left ureter was normal in size, appearance and situation.

Both suprarenal glands were found in their usual situations. The brain was not examined.

Summary.

This case appears to be worthy of record for the following reasons: (i.) The rarity of the condition; (ii.) the boy apparently enjoyed good health for thirteen years, although the remaining renal tissue represented not more than one-eighth of a normal sized kidney; (iii.) the absence of any evidence of damage to the renal tissues on microscopical examination of the urine; (iv.) the presence of both suprarenal glands, indicating their independent mode of development.

This patient was under the care of Dr. A. E. Rowden White, to whom I am indebted for permission to publish the clinical notes.

Reviews.

MIRACULOUS CURES AT LOURDES.

DR. LE BEC's book on the medical proof of the miraculous is interesting reading.¹ It purports to be a medical testimony of the fact of instances of miraculous cure of disease occurring at the shrine of Lourdes. The author claims to review the subject from the standpoint of a scientific observer. The first part of the book is devoted to a dissertation on the "physiology" of the supernatural and the nature of the evidence which exists in support of supernatural cure of organic disease. The question of functional disease is duly considered and the validity of supernatural healing is supported by evidence which the author claims to have collected over a considerable period of years in relation to patients suffering from gross organic disease.

It is admitted that the number of cases in which healing is said to have occurred in a manner unexplained by ordinary physiological processes is a limited one, forming but a small percentage of the thousands of invalids who yearly make the pilgrimage to Lourdes. Twelve cases of organic disease, varying from varicose veins to pulmonary tuberculosis are cited in detail. Skiagrams and photographs of the actual patients are furnished in support of the author's statements in cases of compound fractures and of tuberculosis. Although it must be admitted that the results recorded in these cases cannot be explained upon ordinary hypotheses, the scientific evidence adduced can hardly be regarded as being of such precision as to convince the mind of an unbiased critic of its finality and conclusiveness. The author is evidently a "true believer" and cannot be regarded as entirely unbiased. His efforts to produce a fair and honest account must, however, be treated with respect.

CYSTOSCOPY.

G. MARION AND M. HEITZ-BOYER in their book "Cystoscopie et de Cathétérisme Urétéral" have dealt more or less fully with the whole subject of cystoscopy together with all the urological manœuvres which the use of the cystoscope has made possible.²

The authors declare that it is their aim to present the intimate details of cystoscopic technique and diagnosis so clearly and so minutely that the beginner will be able to use the instrument to accurate advantage. For the experienced specialist this makes the text somewhat wearisome at times.

However, the work is admirable, especially in regard to the correlation between cystoscopic and clinical signs and in the frequent discussions of differential diagnosis.

The details of technique are set out with all the clearness of the French mind and it is hard to find an equivocal direction in the whole range of the book. As in nearly all cystoscopic manuals elaborate operating tables and unusual positions of the patient are advised. These are quite unnecessary. The dorsal position on a plain hard table with the buttocks a little raised on a small sandbag is all that is necessary.

More than one-half of the illustrations are in colour and of an extremely high degree of excellence, but, since the authors unfortunately retain their old-fashioned preference for the uncorrected (that is, upside down) image cystoscope, the localization of objects in some of the drawings is difficult. In the lens (prismatic) cystoscope so widely used to-day the image is corrected and it is to be regretted that such an excellent book is deficient in this respect.

¹ "Medical Proof of the Miraculous: A Clinical Study," by E. Le Bec, Paris, President of the Bureau des Constatations, Lourdes; Translated from the French by Dom. H. E. Izard, O.S.B., L.R.C.S. M.R.C.P., with an Introduction by Ernest E. Ware, M.D., M.R.C.S. (London); 1922. London: Harding and More, Limited; Sydney: Angus and Robertson, Limited; Crown 8vo., pp. xv. + 198, with ten illustrations. Price: 6s. 6d. net.

² "Traité Pratique de Cystoscopie et de Cathétérisme Urétéral," par G. Marion et M. Heitz-Boyer; Deuxième Edition, entièrement refondue; 1923. Paris: Masson et Cie; Royal 8vo., pp. 480, with 60 plates in black and in colour and 214 illustrations in the text. Price, net: Frs. 100.

The direct vision (no lens) cystoscope is rightly given a place of minor importance in the text, but the authors only seem to know of the Kelly and Luy's types of open tube. Of the excellent modification of the direct idea utilized by Braasch they are seemingly ignorant.

Cysto-urethroscopy is well described and the American instruments of McCarthy and Buerger are favoured. The subject of ureteric catheterization in regard to both diagnosis and treatment is given generous space, but the application of the ureteric catheter to children is dismissed with a scant reference which contains no details of the special instruments and technique required. A discussion of pyelography and the use of the opaque ureteric catheter is included, but is too sketchy to be of value to the specialist. In the descriptions of therapeutic ureteric catheterization in anuria, ureteric calculi and renal infections differential diagnosis and the details of treatment are enlarged upon in a most satisfying way. This tendency pervades the whole book and effectually distinguishes it from many works which are mere cystoscopic atlases.

One of the authors (Heitz-Boyer) has done much original work on the subject of high-frequency cauterization. With his own instrument it is possible to utilize two entirely different orders of high frequency applications in the destruction of bladder tumours. In the first place electro-coagulation with the electrode in contact and the sparks relatively hot produces a distinctly thermal effect; secondly sparking (*étincelage*), with the electrode a little separated from the tumour and the sparks relatively cold, produces an effect which is partly mechanical and results from violent disturbance of the tumour cells.

In the cystoscopic division proper the discussion of the visual differential diagnosis of the various forms of cystitis is wonderfully clear and helpful and the same remark applies equally to the chapters on vesical tuberculosis and vesical tumours. The aspect of the bladder neck in senile enlargement of the prostate is excellently described.

The description of syphilis of the bladder is somewhat vague, but this probably results from the rarity with which observations have been recorded, and from the puzzling polymorphism of the lesions.

Of especial interest to gynaecologists should be the chapter on cystoscopy in the genital affections of women and in pregnancy. The form of the female bladder undergoes various changes during pregnancy often rendering ureteric catheterization extremely difficult. In cancer of the cervix the mucosa of the bladder floor shows important alterations varying with the extent of advance of the growth and so valuable prognostic information may be obtained.

FRACTURES AND DISEASED JOINTS.

"The Ambulatory Treatment of Fractures and Diseased Joints" by Carel A. Hoefftcke is a well printed, easily read volume, with profuse illustrations.¹ It is devoted to the description of an extension splint for the lower extremity, as modified by the author from that made by Hessing. The latter practising as a splint maker in Germany designed an ambulatory splint to keep apart the articular surfaces of the joints of the lower extremity by traction. Movement was allowed at the joints, atrophy being prevented by the resultant muscular activity.

Hoefftcke's modification of the weight-bearing portion of the splint to remove pressure from the perineum, is claimed to add greatly to the comfort of the patient. The weight is taken on the *tuber ischiadicum* and buttock by a moulded piece of leather.

For the treatment of fracture of the femur and both bones of the leg the indications and limitations are not clearly set forth. The complexity of the apparatus, the necessity of the presence of a skilled instrument maker and the greatly increased cost would seem to limit its use, apart from surgical considerations.

The rationale of its use in cases of fibrous ankylosis of joints of the lower extremity is similar to that of the more familiar Lewis splint for the hand.

¹"The Ambulatory Treatment of Fractures and Diseased Joints," by Carel A. Hoefftcke, with an Introduction by Frank Romer, M.R.C.S., L.R.C.P.; 1923. London: William Heinemann (Medical Books), Limited; Royal 8vo., pp. 282, with 261 illustrations. Price: 17s. 6d. net.

In the treatment of tuberculous joints, osteo-arthritis and allied conditions there are reports of cases by Frank Romer, Sir W. Arbuthnot Lane and many others. In a book dealing with a special splint in use in England for some twenty years, it would have been useful to have seen the opinions of prominent orthopaedists. The claim is made that movements will do no harm in these cases provided the articular surfaces are kept apart, while an increased blood supply results from active movement. Results are stated to be better than those obtained by methods of immobilization, comparatively full function being finally obtained.

In other parts, opinions freely expressed on surgical subjects coming from one who is unqualified in medicine, are unwelcome. Crude views are expressed on the surgery of paralysis without any differentiation being made between flaccid and spastic types.

The author, too, takes exception to the view that manipulations of joints should be carried out by medical men and not left to bone setters.

BIO-CHEMICAL EXAMINATIONS.

THE value of determining quantitatively some of the blood constituents has received startling confirmation since the introduction of "Insulin" for treating diabetics and other modern remedies for various diseased conditions. Schools have arisen the members of which lay stress on "test" and "maintenance" diets not only for diabetics but also for patients with acute and chronic nephritis, oedema and excessive salt or chloride retention, cholesterolæmia and the gouty diathesis. They also lay stress on the correlation of the blood and urine findings so that the patient may receive the most adequate diet commensurate with his ability to utilize such foods without being poisoned in metabolizing them. To bring these estimations within the reach of clinicians many new tests have been introduced, either simpler than preceding ones or freer from possible fallacies or including reagents of greater permanency. Unfortunately those proceeding from the American school of physiologists including Folin, Denis, Benedict, Myers, Van Slyke *et cetera* are not ready of access to most practitioners in Australia and Dr. Stone has done a real service in gathering together in a small brochure the more recent and important of these tests, for instance those concerning the non-protein nitrogen, urea nitrogen, uric acid, preformed creatinin, total creatin, sugar, chlorides and cholesterol in the blood and the total nitrogen and acidity of the urine and certain dye excretion tests.¹ Commencing with a description of various colorimeters he includes discussions on the interpretation of the findings as well as the preparation of the reagents and tests most suitable for colorimeter methods. Dr. Stone also proceeds to discuss dietary control and gives lists of neutral, alkali and acid producing foods, carbohydrate, protein and purin contents *et cetera*. He also alludes to the "test" diets and maintenance diets of Joslin and other aspects of diabetic treatment, including the use of "Insulin." Dr. Stone might have mentioned that saturated benzoic acid preserves standard glucose solutions, that the diluted test fluids should be tossed into the Nessler reagent, that paraffin oil (used to prevent foaming) is certain to be steamed over into the acid and will foul the colorimeter, that the silica deposit after the non-protein nitrogen test should be removed before Nesslerizing and that in this country at least 0.2 cubic centimetre of urine will hold rather more nitrogen than is convenient for Nesslerizing.

We agree with Dr. Stone that high creatinin values are of less grave import in prostatic obstruction than other forms of kidney disease. The setting is clear and concise and the book can be thoroughly recommended to medical practitioners and laboratory workers interested in blood chemistry colorimetric methods.

¹"Blood Chemistry Colorimetric Methods for the General Practitioner," by Willard J. Stone, M.D.; 1923. New York: Paul B. Hoeber; Demy 8vo., pp. 85, with five figures. Price: \$2.25.

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Clinical Pathology.

IT must be accepted as a matter of fact, regrettable, but nevertheless a fact that the majority of medical practitioners do not avail themselves to a sufficient extent of the aids to diagnosis and treatment that are afforded by work in the laboratory. In the early days when the science of medicine was in its infancy, practitioners in making a diagnosis had to rely solely on the presence of symptoms and signs as manifested by the patient. As time passed and the structure and function of the various parts were better understood, *post mortem* appearances were often found to explain obscure features of disease. It was found too that the application of certain remedies and methods of treatment in many instances resulted in or was associated with an amelioration of symptoms and the recovery of the patient. In these circumstances there was gradually built up a sound, though necessarily incomplete, system of medical practice. With the development of physics and chemistry and their application to the various phases and activities of the body both in health and disease accurate knowledge is supplanting that which in many instances was unproven. In this way also much has been confirmed that was formerly believed and accepted as a result of observation, analogy and deduction.

The student of medicine at the beginning of his curriculum is taught the main principles concerned in the subjects of biology, chemistry and physics. Too often this is merely a summation of dry facts put in the form of set lectures and demonstrations. Little is said as a rule in regard to the application to the body of the principles which are being laid down, and their bearing on its well-being. Later on when he begins his hospital work and is allotted to one of the several wards as clinical clerk, the part of his training that has to do with pure science,

is well-nigh forgotten. In addition he attends set lectures on bacteriology and morbid anatomy. In his study of practical pathology he makes examinations of sputum and knows nothing of the history of the patient from whose respiratory tract the specimen has been obtained. He makes estimations of the urea content of a sample of urine without knowing why the examination is being made in the particular instance. He examines a section of tissue that has been removed from some patient whom he has not seen and in regard to whose condition he is entirely ignorant.

It has been continually emphasized in the pages of this journal that in the practice of medicine the closest possible cooperation is necessary between general practitioner, physician or surgeon and laboratory expert. It is not for the good of the patient or of the medical practitioner that laboratory investigations should be carried on by the worker in that field without this cooperation. Access to the patient should at all times be possible for those who have any investigations to carry out in the laboratory. If these conditions are to obtain in actual practice after graduation, the groundwork should be laid during student days. Practical pathology should be taught at the bedside as well as in the laboratory. Tutors are appointed in medicine and surgery, but no such appointment is made in regard to clinical pathology. A tutor in clinical pathology would have the duty of seeing that the student undertakes all necessary laboratory investigations in the treatment of a patient who might be assigned to him; the work would be done in the light of clinical knowledge and collaboration with the tutor in medicine or surgery as the case might be. The student would be carrying out his investigations in a way which he would naturally continue in subsequent private practice. One effect of the adjustment of work in this manner would be the inculcation of what may be called the pathological habit in future practitioners. Of course there is always to be borne in mind the danger of allowing a student to suppose that diagnosis is merely a question of proof by exhaustion of every possible test. Just as clinical study without laboratory work is incomplete and

productive of error, so the latter without due regard to the former is an attempt to work by rule of thumb which is doomed to failure.

There is the larger issue to be remembered. A proper adjustment of laboratory research and clinical observation cannot fail to lead to a fuller understanding of disease. In this way the outlook of the practitioner will be widened. He will realize that the treatment of an individual is not as important as the thorough comprehension of the pathogenesis of his ailment.

Current Comment.

ANOMALIES OF INTESTINAL ROTATION.

THE differentiation of the primitive alimentary canal in the embryo into fore-gut, mid-gut and hind-gut takes place at a very early stage. This occurs at the end of the third week. From the fore-gut is developed that part of the alimentary canal anterior to the opening into the duodenum of the common bile duct. From the hind-gut are developed the rectum, sigmoid flexure and descending colon. These two portions of the embryonic gut may really be regarded as diverticula of the yolk sac. The mid-gut is represented by the roof of the yolk sac and from it are developed the intestinal tract from the opening of the common bile duct to the splenic flexure. The subsequent evolution of the mid-gut is much more complex than that of either the fore- or hind-gut. For this reason developmental errors are much more likely to occur in connexion with this portion of the intestinal tract. By the fifth week the mid-gut is represented by a U-shaped loop from the roof of the yolk sac. A long neck has developed to the yolk sac. This is the vitello-intestinal canal. If it persists it is known as Meckel's diverticulum. The U-shaped loop is at first really extra-abdominal. Along the centre of the mesentery of the loop runs the superior mesenteric artery. The loop subsequently returns to the abdominal cavity, but before this occurs the appendiceal bud has appeared on the posterior segment. Rotation of the loop then commences and takes place in a direction contrary to that taken by the hands of a clock. With growth of the segment anterior to the artery the loop returns to the abdomen.

The subject of anomalies in the process of rotation has been studied recently by Dr. Norman M. Dott.¹ Dr. Dott divides the stages of rotation into three. He points out that the left umbilical vein persists and the right one disappears. As the right lobe of the liver enlarges and descends, the left umbilical vein is carried downwards and to the right. Pressure thus is brought to bear on the pre-arterial segment of the loop and the gut is carried

caudally and to the right. The post-arterial segment is then naturally carried upwards and to the left. Dr. Dott describes the second stage of rotation as the result of the passage of the mid-gut loop from the umbilical cord into the abdominal cavity. He refers to the work of Frazer and Robbins. These observers pointed out that it was not possible for the mid-gut loop to enter the abdominal cavity *en masse* through the narrow umbilical orifice. The caecum on account of its bulk offered resistance to the passage. They held that the pre-arterial segment entered first in continuity of its length, basal end foremost. If this is so, the resulting condition is easily understood. The artery is suspended between the aorta and the umbilicus. The small intestine enters the abdomen on the right side of the artery. The hind-gut which occupies a position in the middle line, is pushed to the left and backwards. When the caecum enters the abdomen, the colon tends to become straightened out and the caecum is carried upwards and to the right. The result is that the colon lies across the pedicle of the intestinal mass at the origin of the superior mesenteric artery and the caecum attains a position below the liver. Dr. Dott points out that the result of the second stage of rotation is a turn about the axis of the superior mesenteric artery of 270° from the primitive position of the loop and not 180° as is often stated. The third stage is characterized by the descent of the caecum as a result of elongation of the colon and the fixation of certain portions of the intestine to the posterior abdominal wall by fusion of mesentery and parietal peritoneum.

Dr. Dott points out that derangements may occur in any of these stages of rotation. Derangement of the first stage does not occur except in the presence of extroversion of the cloaca. Derangements of the second stage are only possible if there is an interference with the sequence of the entry of the different parts of the mid-gut loop into the abdomen. Dr. Dott discards as untenable the view that the presence of adhesions may be a causative factor in the aetiology of these derangements. He states that the intestines could only reach their abnormal site if they were quite mobile. He refers to a case reported by Hunter, of Sydney, in which retro-jejunal position of the transverse colon was associated with the presence of a mesenteric cyst of jejunal origin. Hunter in discussing the mechanism of the production of this condition, held that the cyst had formed in the embryo before the return of the mid-gut loop to the abdominal cavity and that for this reason the post-arterial segment returned more easily. Anchorage was provided by the cyst and there was a reversal of the order of return on the segments. Dr. Dott can find in the literature no instance similar to that described by Hunter. In the case which he reports, no such condition was present and he suggests that disorderly reduction might occur in the presence of an unduly wide umbilical orifice. Dr. Dott states that the derangements of the third stage are of the nature of incomplete development. He divides derangements of the second stage into three groups: those

¹ The British Journal of Surgery, October, 1923.

due to non-rotation, those due to reversed rotation and those due to mal-rotation. He reports one example of each of these three varieties. The case of non-rotation was seen in a male infant who was taken ill on the fifth day after birth. At operation a volvulus was found of the whole of the mid-gut loop. The loop was twisted round a narrow pedicle. Occlusion of the duodenum was present. Dr. Dott concludes that twisting was possible on account of the deficient stabilization by secondary adhesion of the mesentery. In the case described by Dr. Dott as due to mal-rotation the whole of the small intestine with the exception of the first and second parts of the duodenum were found twisted. The caecum and appendix were found lying behind the pylorus. Dr. Dott concluded that the intestines had been in a state of mal-rotation at the time of birth, the duodenum lying in front of the mesenteric pedicle and the caecum in the sub-pyloric position. As the caecum had failed to reach the right iliac fossa, no secondary adhesion of the mesentery had taken place. The case of reversed rotation was seen in a man, aged sixty-eight years. He was admitted to hospital suffering from acute intestinal obstruction. He had suffered from a similar attack ten years previously, but spontaneous recovery had taken place. At operation the ascending colon and caecum were found possessed of a free mesentery. Torsion had occurred. After reduction of the volvulus it was found that the colon from the hepatic flexure took a course along the posterior abdominal wall under the mesenteric vessels near their origin. The small intestine lay anterior to the colon and the mesenteric vessels. Dr. Dott states that it is clear that a reserved rotation of the mid-gut had taken place at the second stage of embryonic intestinal rotation. The colon had thus passed behind and the small intestine in front of the mesenteric vessels. The normal adhesion of the mesentery had proceeded down towards the right iliac region and the transverse colon had been trapped in a tunnel between the original root of the mesentery and the secondarily acquired attachment below. Secondary adhesion of the mesentery had been incomplete and the caecum and ascending colon had been left free.

Dr. Dott discusses the diagnosis and treatment of these conditions. The chief interest of his communication, however, lies in his clear presentation of the classification and the developmental aspect. The prompt recognition of the essential nature of such a rare condition is of primary importance. *

ECCHORDOSIS PHYSALIPHORA SPHENO- OCCIPITALIS.

In a recent issue reference was made to a communication by Dr. J. le F. Burrow and Dr. M. J. Stewart on the subject of malignant spheno-occipital chordoma, a tumour of low grade malignancy arising from vestigial remains of the primitive notochord. In a further article they discuss the relationship between the neoplastic chordomata and the small jelly-like nodules occasionally found on the *dorsum sellae* and termed by them *ecchordosis*

physaliphora spheno-occipitalis.¹ They point out that these small jelly-like nodules were regarded by Virchow as having a cartilaginous origin. In this belief he applied to them the term *ecchondrosis physaliphora*. They refer to the work of Müller in suggesting the notochordal origin and to Ribbert's subsequent confirmation of this. Ribbert was successful in reproducing a similar condition in rabbits by puncture of the intervertebral discs. The puncture was followed by hernia of the *nucleus pulposus* and the nodule of tissue so formed subsequently increased in size and manifested evidence of cellular proliferation. Ribbert suggested the use of the term chordoma. Burrow and Stewart point out that the chordomata are genuine neoplasms and possess in most instances many of the stigmata of malignancy. They regard the jelly-like nodules as being notochordal protrusions rather than tumours. They possess very limited powers of growth. Only in one instance has such a tumour been the direct cause of death. Ribbert regarded these tumours as of common occurrence. Burrow and Stewart found them present in only three instances among two hundred specially investigated autopsies. They suggest that the term *ecchordosis physaliphora* is more suitable than the name applied by Virchow.

THE AUSTRALIAN JOURNAL OF EXPERIMENTAL BIOLOGY AND MEDICAL SCIENCE.

ON March 15, 1924, there appeared the first number of a new quarterly journal, *The Australian Journal of Experimental Biology and Medical Science*. This journal is published at the University of Adelaide for the Medical Sciences Club of South Australia and it is sustained by the Miss A. F. Keith Sheridan Bequest to the University of Adelaide for medical research. The managing editors are Professor J. B. Cleland and Professor T. Brailsford Robertson. These gentlemen will be assisted in the selection of papers by a board of editors consisting of seventeen well known and prominent members of medical, biological and veterinary circles in different States of the Commonwealth. It is intended to publish articles embodying the results of original research in bacteriology, biological chemistry, experimental medicine or surgery, experimental pathology, experimental zoology, genetics, immunology, parasitology, pharmacology and the physiology of plants and animals. The first number consists of thirty-seven pages and contains four articles. A. B. Anderson reports his observations on the effect of phloridzin on the mortality from "Insulin" hypoglycemia in mice. M. T. Mitchell contributes an article entitled "The Substitution of Taurine for Cystine in the Diet of Mice." O. W. Tiegs discusses the mechanism of muscular action and T. Brailsford Robertson writes upon the influence of hydrolysis upon the capacity of proteins to bind acids and bases. There is scope for a journal such as this and we congratulate the editors on the production of their first number.

¹ *The Journal of Neurology and Psychopathology*, November, 1923.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

A Dangerous Universal Donor.

PHILIP LEVINE AND JENNIE MABEE (*Journal of Immunology*, November, 1923) detail experiences which appear to them to make it advisable to introduce a quantitative modification in the technique of the direct test of Coca. In the carrying out of this test the donor's citrated blood is diluted with saline solution 1 in 10 and then mixed with an equal volume of the recipient's citrated blood. The mixture is carefully watched for fifteen minutes for evidence of agglutination. In a class demonstration of this method it was found that when L. (belonging to Group II., Jansky) was used as recipient and M. (belonging to Group I., Jansky) as donor, agglutination resulted. This reaction was unexpected, since cells of Group I. do not contain agglutinable substances and the serum in the test was diluted 1 in 10. In this dilution the agglutinating power of Group I. serum is supposedly weakened to a sufficient extent to prevent clumping of the agglutinable Group II. cells. Possibility of auto-agglutination of L.'s cells was excluded and further examination showed that the degree of agglutination of L.'s washed blood cells was proportional to the quantity of M.'s plasma or serum added. Further experiments were carried out to determine: (i.) The specificity of the action of M.'s serum upon L.'s cells and (ii.) the agglutinating power of other Group I. sera. It was found that M.'s serum diluted 1 in 10 agglutinated the cells of seventeen out of eighteen individuals not belonging to Group I. and the cells of the eighteenth were agglutinated in a dilution of 2 in 10. Of twenty-six Group I. sera tested M.'s serum was the only one with this remarkably strong agglutinating power. Were M. to act as universal donor to any of the seventeen patients (not Group I.) tested, with one possible exception, two hundred and fifty cubic centimetres of her blood or one-half the amount usually transfused would cause complete agglutination of the recipient's cells. These findings have led the authors to attach far more importance to the direct method of determining suitable donors. They, however, consider it safe to assert that any individual belonging to Group I. can be accepted as a universal donor whose serum in a dilution of 2 in 10 causes no microscopically detectable agglutination of the recipient's cells. They therefore recommend that in the performing of Coca's direct method test the donors citrated blood be diluted with saline solution 2 in 10 instead of 1 in 10 before being mixed with an equal volume of the recipient's blood.

Prophylactic Inoculation of Animals Against Rocky Mountain Spotted Fever.

HIDEYO NOGUCHI (*Journal of Experimental Medicine*, November, 1923) reports the result of experiments carried out in an attempt to devise a practical method by which a non-immune population might be rendered immune to the bite of infected ticks. The guinea pig was the animal selected for use in the experiments as in respect of the morbidity and mortality of spotted fever infections it most closely approaches man. Freshly prepared mixtures of the virus of spotted fever and serum of immunized rabbits in neutral or super-neutral proportions were found to confer complete immunity on guinea pigs. For the production of an effective sero-vaccine the virus used must be a highly virulent strain and the immune serum of high potency. Blood is drawn from infected guinea pigs at the height of fever and the clear serum separated from the clot. The titre should be such that one cubic centimetre contains one hundred minimum lethal doses of virus. Virus of uniform virulence can be obtained in large quantities by the pooling of a number of sera. Immune rabbit serum of such a titre that 0.1 cubic centimetre will neutralize one hundred minimum lethal doses is mixed with the virus in ten times the neutralizing dose. A less potent immune serum is unsuitable because an inconveniently large quantity would be required. The mixture is heated to 56° C. for twenty minutes in a water bath and preserved in a refrigerator till required. Two or more injections of one cubic centimetre of the mixture are given subcutaneously. The virus alone or mixed with normal rabbit serum when allowed to die by prolonged preservation at refrigerator temperature or when killed either by heating at 60° C. for twenty minutes or by chemicals (chloroform, ether or xylene) does not produce immunity in guinea pigs. The ultimate object of these experiments is the production of an active sero-vaccine which may be safely used in the prophylactic inoculation of man.

The Thermal Death-Point of Tubercle Bacilli in Milk.

F. W. CAMPBELL BROWN (*The Lancet*, August, 1923) considers the question of the thermal death-point of the tubercle bacillus in milk and presents certain conclusions. After suggesting possible causes for the varying results recorded by previous workers the author details his own experiments. Cultures of tubercle bacilli were obtained from ox glands, milk, human sputum, joints and bones, a total of thirty-five strains. Pure cultures were obtained as follows. A 10% solution of antiformin was added to an equal quantity of infected material, the mixture well shaken and single loopfuls were sewn on to culture media after varying lengths of time. In this way a point was reached when extraneous organisms are killed and

only the more resistant tubercle bacilli remain alive. The medium used was Dorset's egg or a modification. Glycerine was added in the case of human strains. The milk infected with tubercle bacilli was carefully prepared for Pasteurization experiments, an emulsion of 0.2 gramme of dried bacilli and one cubic centimetre of sterile milk being added to five cubic centimetres of milk at a temperature of 67° C. in a specially designed flask. The flask was kept submerged in a water bath at 60° C., the addition of one cubic centimetre of emulsion at room temperature reducing the temperature of the five cubic centimetres from 67° C. to 60° C. immediately, thereby enabling the experiment to be commenced at the temperature desired for the duration of the test. Samples of the infected milk were withdrawn at intervals, quickly cooled at 30° C. and inoculated into guinea pigs; each pig received 0.02 gramme of tubercle bacilli in one cubic centimetre of milk. The guinea pigs were killed at the tenth week after inoculation and examined for evidence of infection with tubercle bacilli. It was found in the first place that the thermal death-points of the human and bovine types of tubercle bacilli were practically identical and secondly that exposure of milk to a temperature of 60° C. for twenty minutes or to a temperature of 70° C. for five minutes would cause the death of tubercle bacilli present. The author recommends the former exposure as less likely to detract from the food value of the treated milk and is of the opinion that until bovine tuberculosis can be stamped out at its source proper Pasteurization of milk is the only method of rendering milk fit for human consumption.

Production of Antibodies in Rabbits by an Intratracheal Method.

F. S. JONES (*Journal of Experimental Medicine*, June, 1923) gives details of a simple method of producing antibodies in rabbits by the administration of antigen through the larynx. He found that a metal tube nine centimetres long with an external diameter of three millimetres bent to an angle of 70° could be easily introduced into the trachea through the glottis. The tube has two openings on opposite sides a short distance from the end. The rabbit is sufficiently anesthetized to ensure complete relaxation, the tongue is drawn forward and the tube, previously immersed in paraffin oil, is passed over the tongue and through the larynx. The fluid is then introduced by means of a syringe connected to the tube. Series of rabbits were immunized in pairs, one of each pair receiving the dose of antigen intraperitoneally the other by the trachea. The results obtained by the two methods were practically identical when the antigens used were suspensions of red blood cells or bacteria. It is claimed, however, that the intratracheal route is safer, more rapid, less painful and by its means injury to the animal is largely eliminated.

HYGIENE.

Medical Insurance in Norway.

TORLUF TORLAND (*Northwest Medicine*, January, 1924) points out the changes which the war has worked in the medical world of Norway mainly on account of the ascendancy of the soviet class in its government. He points out that provision is made for a sick insurance act which provides for insurance in case of sickness of all kinds from colds to abdominal operations and even includes childbirth. Every man and woman over fifteen years, working in the employ of others, labourers, skilled and unskilled, clerks, public service men, maids, servants, in short everyone whose income does not exceed 6,000 kroner (£200) a year comes under this insurance. This means practically all the great middle class of people. Out of it has developed the sick benefit society which is under government initiative and control. Each town has one, while there is one in each country district, all directed from a central organization in the capital, Christiania. Each society makes its own contracts of fee schedules with the different doctors in the community and a list of all medical men under contract is published, members making their own choice. The expenses are paid through the Government out of a fund made in the following proportions: One-tenth by the employer; one-tenth by the Government; two-tenths by the local government and six-tenths by the insured person. The premium ranges from fifty to one hundred and ten ore (4d. to 7d.) a week according to income and the kind of work in which the insured is engaged. For this the insured gets free medical attendance for all sickness with the choice of practically all the medical men in the community, free hospital treatment and while there, free medicine, dressings and surgical operations. Attendance at confinement is free, while an ordinary patient gets approximately 60% of his wages for the full time of sickness. In many instances the system has completely excluded private practice with the exception of the older well-known men. The younger man who is beginning, must rely for his practice on the different societies and as the hospitals do most of the work, there is little chance for an ambitious young man to follow his patients and undertake surgical operations. In conclusion, the author states that after talking freely with both patients and doctors, his impression is that the law has worked well and has been a blessing to the great mass of people whose income is small and who usually have nothing when sickness comes and a doctor is needed. Also the medical men have been satisfied on the whole, their contracts and fee schedules have, thanks to their medical associations, been good. Most of them earn a good living income.

Absorption of Lead by the Upper Respiratory Passages.

HERMANN L. BLUMGART (*The Journal of Industrial Hygiene*, September, 1923) states that in his experiments lead was used because a trustworthy method for the determination of minute amounts in biological material is known. He used the carbonate because it appears to be readily absorbed judging by its importance in the production of lead poisoning. The portals of entry for lead are respiratory, gastro-intestinal and cutaneous, the last being of very minor significance. The incidence of lead poisoning is proportional to the existent dustiness and the views are that it is inhaled into the lungs and absorbed or lodged in the upper respiratory passages. The author points out another possibility, absorption from the upper air passages. Working on the principle that the function of the upper air passages is filtration, since horses, breathing exclusively through the nose, that have lived in dusty mines for years show an absence of pneumonokoniosis of the lungs, he sets out to prove that absorption of this deposited lead takes place from the upper respiratory passages. No direct evidence of absorption exists, but the unusually rich blood supply and the close mesh work of submucosal lymphatics seem to favour such a process. As the problem seemed particularly susceptible to experiment, the following work was carried out: Using anaesthetized dogs and cats the neck was incised in the mid line. The oesophagus was occluded by two ligatures. The trachea was cut through, a glass canula was inserted into the lower end, the upper end occluded. Finally powdered carbonate of lead was carefully sprayed into nose with an atomizer, the amount was measured. Saline solution and glucose were introduced intraperitoneally. The animals rapidly weakened and died in twenty to thirty-six hours. The trachea and oesophagus were found to have been completely obliterated by the ligatures, the head was removed and discarded with the skin. The skeleton, remaining internal organs, muscles and liver were all separately analysed. In one instance 0.47 gramme of lead dust were sprayed in and autopsy disclosed the following amounts of metallic lead: Skeleton, 23.3 milligrammes; liver, 0.5 milligramme; muscle, 0.3 milligramme; internal organs, 0.2 milligramme; trachea, lungs and oesophagus, nil. The author's conclusions are that: (i.) Particulate matter in the form of pulverized lead carbonate is readily absorbed from the upper air passages of cats and dogs; (ii.) the absorption is rapid and of a magnitude far in excess of the minimal toxic dose; (iii.) absorption in industry of lead salts by the upper respiratory passages would therefore seem to be a definite possibility.

Under-Nourishment in Industry.

WILLIAM HALL BUNN (*The Journal of Industrial Hygiene*, September, 1923) defines under-nourishment as that physical state evidenced by underweight (according to the standard height, age and weight table), anæmia, flabby musculature, relaxed skin and poor sustained response to mental and physical effort. This is the picture presented by a patient convalescent from typhoid fever, an underfed prisoner of war or the patient with pyloric obstruction. Under-nourished to a lesser degree, but quite definitely so, many workers are trying to "carry on" in competition with their healthy fellows. The author states that he uses the word anæmia in preference to pallor, although pallor is the objective sign upon which most of his observations were based. He finds that the colour of the conjunctiva and mucous membranes is nearly always in agreement with the laboratory findings, consequently, unless patients are definitely anæmic or progressively so, observation is the criterion in defining the presence or absence of anæmia. Flabby musculature means the state of under-development and lack of tone in the skeletal muscles which permits the cheeks to sag, the biceps to remain soft and the shoulders to drop. Relaxed skin is evidence by cold and clammy hands and feet. Loose folds of skin are easily picked up over the greater muscles and backs of the hands. There is poor tissue turgor. The under-nourished worker tires easily and grows mentally weary long before his fellows. His rest is not refreshment and he is prone to develop troublesome infections. On work in which the element of fatigue does not usually enter, it is found that the amount of work done by those who are under-nourished, is less than the average amount, because of mental weariness and physical weariness, while in machine work, where speed is not a criterion, the amount of spoilage in the under-nourished is high. He points out that the number of workers who are under weight without any other signs of under-nourishment, are numerous on plants employing women. In his experience individuals in this class, whether under-nourished or not, are under weight because of either family characteristics, disease, unusual physique, lack of knowledge of proper diet or haste or carelessness in eating. Maintenance of weight is one, if not the best criterion of good health among individuals who are able to work, while the comparison of weight on previous examinations is very valuable. Under-nourishment and low efficiency go hand in hand and those who are 4.5 kilograms (ten pounds) under weight (from other reasons than family characteristics) are often below the average of other workers in a department.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on February 1, 1924, Dr. D. GIFFORD CROLL, C.B.E., the PRESIDENT, in the chair.

Paramyoclonus-multiplex.

DR. K. B. FRASER showed a male patient, forty-three years of age, who had been ill for five and a half months. The patient had been born in England and had lived in Australia for seven years. For the previous six and a half years he had been a tram driver. He was a moderate smoker and took very little alcohol. The family history revealed nothing of note. When first seen on August 15, 1923, he had complained of having been ill for three days with pain over the lower ribs. He had vomited, had had diplopia and general malaise. He had described the pain as stabbing and spasmodic in character. His temperature had been 37.4°C . (99.4°F .), his pulse rate eighty-four and his respirations eighteen. He had been somewhat tender over the lower ribs and had winced continually as if suffering from severe spasms of pain. The tongue had been dry and furred and he had looked ill. Examination of the respiratory and circulatory systems had failed to reveal any abnormality. There had been no nervous phenomena. Five days later definite colic spasms had occurred at regular intervals. These had been mainly in the abdominal muscles, but had involved also those of the shoulder and gluteal regions. The patient had been in two hospitals for a period of five weeks and during this time the spasms had continued. Fever which was at first moderate, had become intermittent. Sedatives and hypnotics had had no effect and he had suffered from delusions and obsessions during part of this period. The movements had soon become localized to the muscles of the abdominal wall. They had been rapid, more or less rhythmical and had continued during sleep. His general condition had gradually improved, but the myoclonic spasms had continued. At the time of demonstration the movements were slower and less evident, the rate being forty-eight per minute. They did not cease during sleep and he had no voluntary control over them. The deep and superficial reflexes were present, the plantar reflex was flexor in type, the pupils were equal, small and reacted to light and accommodation. There was no muscular paresis, incoordination or spasticity. The epicritic, painful and thermal sensations were somewhat impaired over the areas of distribution of the eleventh and twelfth thoracic and the first and second lumbar segments on the right side. Romberg's and Kernig's signs were absent. There was no loss of control over the bladder or rectal functions. The serum had not reacted to the Wassermann test. X-ray examination of the thoracic or lumbar vertebrae had failed to reveal any abnormality. Examination of the eyes revealed the presence of a mixed astigmatism. The fundi were normal. Dr. Fraser said that he had made the provisional diagnosis of that rare condition *paramyoclonus-multiplex*. He asked for an expression of opinion from the members in regard to the diagnosis.

DR. J. V. DUNN considered that the condition was probably one of *encephalitis lethargica*. He based his opinion on the diplopia which had cleared up, the fever and drowsiness and the spasm which were equivalent to hiccup.

DR. E. S. MEYERS thought that the condition was probably the myoclonic type of *encephalitis lethargica*. He had seen a similar condition in a woman, aged sixty-five years, who had had spasms in both legs occurring every second and lasting for twenty minutes at a time.

DR. EUSTACE RUSSELL said that this patient had been under his care at the Brisbane General Hospital. He had regarded the condition as one of tetanus. Thorough investigation, however, had failed to confirm this.

Carcinoma of the Larynx.

DR. R. GRAHAM BROWN showed a female patient, aged fifty-eight years, who had been demonstrated by him on several previous occasions. The patient had had complete

laryngectomy performed on account of malignant disease. He had shown her at the Branch meeting on October 5, 1923. At this time two small glands had been situated in the lower third of the posterior triangle on the right side of the neck. He had then expressed the opinion that the enlargement of the glands was due to chronic inflammation and had promised to report the result of pathological examination of the glands after their removal. The pathologist had reported that the condition was due to chronic inflammation. Since the previous meeting an attempt had been made to provide the patient with an artificial larynx from the skin of the neck. This had been partially successful. A series of pitch pipes had been used in connexion with this and very gratifying results had been obtained. The patient demonstrated her vocal powers by giving a brief history of her case and she was heard distinctly all over the meeting hall. Dr. Graham Brown pointed out that, although no air had passed through her nasal and buccal cavities for three and a half years, she had recovered her nasal resonance to a moderate extent. He also said that he hoped to bring the patient before the members at some future date and he hoped to be able to communicate the result of his investigation into the physiology of the larynx in relation to voice production.

Hydronephrosis.

DR. M. GRAHAM SUTTON demonstrated a right kidney and read the clinical history of the patient from whom it had been removed. The patient, an unmarried woman, aged twenty-nine years, had been admitted to the Lady Lamington Hospital on January 8, 1924, complaining that two weeks previously she had suddenly experienced great difficulty in passing urine. After the expulsion of blood clots the flow had been easier. She had been passing blood in the urine on and off for two years; this had been associated with attacks of dysuria at about three-monthly intervals. The pain had often been severe enough to induce vomiting. She had not experienced any frequency or burning pain. About eight days before admission to hospital she had experienced an aching pain in the left loin and this had been present at intervals. The pain had been constant while it lasted and did not radiate or shoot in particular direction. It had not been modified to any appreciable extent by either exercise or rest. On examination it had been found that the patient was a small, poorly nourished girl with a sallow complexion. Her heart had not been enlarged, but a localized systolic murmur had been audible with no accentuation of the aortic second sound. The lungs had been normal. The left kidney, definitely enlarged and easily palpable, had been neither mobile nor tender. The right kidney had been slightly enlarged but not tender. The reaction of the urine on January 8, 1924, had been alkaline and the specific gravity 1015. It had contained phosphates and swarms of bacteria from long standing. It had been very smoky in appearance from the presence of blood, but no casts or pus had been present. Cystoscopic examination had been undertaken two days after admission with a single catheterizing cystoscope and this had been introduced into the bladder without difficulty. Two irrigations had been sufficient to ensure a clear medium. The bladder capacity had been ample. The fundus, lateral and posterior segments of the bladder had been normal. The whole trigone had been definitely hyperæmic and congested in appearance, making the localization of the ureteric meati a matter of some difficulty. The orifice on the left side had been swollen, red, somewhat rounded in contour and had emitted an efflux, weaker than normal, at intervals of every twenty seconds or more. The meatus on the right side had also been reddened in appearance, but not swollen; its efflux had been stronger and had occurred at intervals of four to five seconds. A catheter had been passed with ease on the left side as far as the renal pelvis, but no urine had been obtained. It had been found subsequently that this was due to blocking with old blood clot. On withdrawing the cystoscope and attempting to pass a ureteric catheter on the right side the bladder had become intolerant to the point of incontinence. Deep anaesthesia had been necessary for further examination. The urine collected from the right kidney had been acid, clear and free from pus, albumin and blood. No urine had

been collected from the left side. The indigo-carmin test had been applied. The dye had appeared on the right side in eight minutes and the colour had been intense in fifteen minutes—a normal reaction. On the left side a trace of dye had appeared in sixteen minutes, but the colour had not become deep at the end of twenty-five minutes. The urea concentration test had been applied. One hundred and sixty-seven cubic centimetres of urine had been passed in the first hour (polyuria). This had contained 2.2% urea (corrected figure). During the second hour eighty-two cubic centimetres of urine had been passed containing 2.35% urea. This result had been regarded as satisfactory. The phenol-red test, done concurrently, had yielded 26% of dye in the first hour and 22.6% in the second hour—a low but quite adequate amount. The result of the test obtained at the end of the first hour had probably been too high since the sample had contained a good deal of blood.

Cesophagoscopy.

DR. E. CULPIN showed specimens of foreign bodies (pins and mutton bones) which he had removed from the cesophagus by means of the cesophagoscope. Dr. Culpin pointed out the danger of using a probang for the removal of such foreign bodies.

Glycosuria and Diabetes.

THE PRESIDENT explained that the late DR. G. E. RENNIE, of Sydney, had been invited by the Council to read a paper before the Branch. This had been arranged for August, 1923. Unfortunately it had been impossible to carry out this arrangement owing to Dr. Rennie's illness and subsequent death. With the consent of Mrs. Rennie the paper would be presented by Dr. S. F. McDonald.

DR. S. F. McDONALD then read the paper by the late DR. G. E. RENNIE entitled "Glycosuria and Diabetes" (see page 301).

Dr. McDonald after reading Dr. Rennie's paper said that it was difficult for him to describe adequately how honoured he felt at having been chosen to read Dr. Rennie's paper. He had looked forward all the previous year to Dr. Rennie's visit and the sense of disappointment and personal loss at the news of his illness and death were difficult to describe. Although he had only met Dr. Rennie on a few different occasions during the Congress of 1920, yet those few meetings had left an impression far greater than that created by any other figure at that Congress. On looking back it was easy to see why. Dr. Rennie was of that great generation of scientific clinicians of whom England had been so fertile in the previous century.

It was a transition generation in that its members gained their education from such older clinicians as Walsh or Skoda and their lives were at the same time being influenced by the new light thrown on medicine and surgery by Pasteur, Lister, Koch and Virchow. In the greater men of this generation such as was Rennie, this association produced a habit of mind in which advantage was taken of any newer methods, yet the knowledge gained at the bedside by eye, ear and hand formed the basis of diagnosis, progress and treatment.

Would any of his hearers cast their minds back to the examination of a possible case of pulmonary tuberculosis? Let them recall the careful history in which no point of importance, however irrelevant it appeared, was missed, the detailed list of symptoms, the systematic orderly examinations, the almost automatic recognition of small signs for which others had painfully to search, the just consideration of laboratory tests as part of the whole and the final judicial summing-up. It might be that at the end they agreed with Sir Michael Foster—that no sane man made a final diagnosis, but they had a mental picture of that patient's make-up which with all scientific methods was too seldom attained. And in no way did they dispute the aids which the bio-chemist, radiologist and even the surgeon placed in their hands.

One had only to remember the whole tone of Dr. Rennie's paper to realize the scientific delight with which they welcomed every new piece of work which would help to throw light on their art. Their own youth had been so

influenced by the medical *renaissance* that their joy in the knowledge remained with them always. It must be remembered too that many of them spent years after qualification toiling for what modern graduates would consider an insulting pittance in the dissecting rooms and laboratories of their hospitals. Not least of their influence was in the direction of *post mortem* study, the constant checking of bedside theories and deductions by the stern and unanswerable facts of the mortuary table. Presumably, it was of some of them that Stevenson wrote his glowing preface, of which one sentence summed up the whole matter: "They are the flower, sweet as it is, of our civilization."

Thus it was that Dr. Rennie's paper as he wrote it was a complete and lucid summary of medical knowledge. Much had happened since then and they were even now only beginning to be able to judge its value, but most of the new work centred about the product "Insulin." He would not recapitulate the history of this remarkable discovery, but he would very shortly indicate its value and quote one case in which it had been of value and another in which it had been unnecessary. In the first place "Insulin" was always to be looked on as a potent and a dangerous drug if ignorantly used. One over-dose would produce a hypoglycæmia which might easily prove fatal and an over-dose would be quite a small amount in an individual with a low blood sugar content as in *diabetes innocens*.

Hence the first question to be asked in any case of glycosuria was: "Is the condition *diabetes mellitus*?" This question could only be answered by the carbohydrate tolerance tests described in Dr. Rennie's paper. In any case of true *diabetes mellitus*, thus determined, what were the indications for the use of "Insulin"? The absolute indications were coma or threatened coma, grave surgical interference requiring an anæsthetic, steady progressive disease, especially in young patients. The relative indications were the necessity of increasing the patient's general comfort and felling of well-being and of building up a patient wasted by severe dietetic treatment sufficient to check the glycosuria. It was not necessary in patients who could be adequately controlled by dietetic means. Since "Insulin" had been made available he had told many more patients that they were not suitable for its use than the reverse. In view, however, of the rest which "Insulin" gave the pancreas and the improvement in general well-being he was inclined to think it would be much more used in the future for patients whose condition was amenable to dietetic treatment.

The first case quoted by Dr. McDonald was that of J.B., *ætatis* thirty-five years, a returned soldier whose weight was sixty-six kilograms (one hundred and forty-five pounds). This patient had suffered from glycosuria in 1918. His urine had constantly contained 1% or more of glucose. The quantity passed every day had varied from 4,000 to 6,000 cubic centimetres. It has been found possible to make the urine sugar-free by starvation. The quantity of urine, however, had become fixed at 5,000 cubic centimetres daily and this had contained fifty to one hundred grammes of sugar, while the patient had taken a diet consisting of lean meat or fish three hundred and sixty grammes, three eggs, diabetic or bran bread sixty grammes and green vegetables three hundred and sixty grammes. This diet had represented about one thousand calories, a low ration. The patient had been satisfied with this diet. There had been great variations in the amount of sugar while the patient was taking the fixed low diet, the urine had seldom been sugar-free. Smuggling of food to the patient had been suspected, but never proved. In spite of this he had lost little weight. He had felt well and the appetite had not been excessive. The thirst had been excessive, but not unnaturally so in view of the large urinary output. In March, 1923, a sugar tolerance test had been carried out. The result of the test had been charted and it had been evident from the chart that the blood sugar before the performance of the test was normal, but even so his urine had contained 1% of glucose. The rest of the curve had shown a delay in returning to normal and an unusually high rise, indicating a defect in the storing of glucose. This had been borne out by the fact that attempts to increase his diet resulted in weakness,

wasting, polyuria, polydipsia and a feeling of depression. He had, therefore, been quite comfortable and his condition had been satisfactory with the restricted diet. There had been no need for the use of "Insulin."

Dr. McDonald's second patient had been a man fifty-seven years of age who had weighed fifty-one kilograms (one hundred and fourteen pounds). He had suffered from diabetes for many years, in fact his urine had not been sugar-free for twelve years. He had done fairly well on a restricted diet containing about fifty grammes of carbohydrate and with a caloric value of a thousand. In June, 1923, he had begun to fail and as the result of a blow had developed a large indolent sloughing ulcer on his heel. At the suggestion of Dr. A. C. F. Halford the patient had been examined and "Insulin" had been used very cautiously. At this stage the patient had become very bored and sceptical and gone off to the country. He had returned in September with a still more ulcerated heel and not in such a good state of health. He had been sent to hospital again and had been given nine units of "Insulin" thrice daily. At the end of a week he had had no nycturia and his urine had been sugar-free for the first time for twelve years. He had remained in hospital for six weeks and had received decreasing doses very much on the plan described by Dr. Duhig. Finally he had put on 1.35 kilograms (three pounds) in weight and had left the hospital. A small sinus had opened in the heel, but at the time of demonstration the wound had closed completely. After discharge from hospital the patient had come every morning for an injection of three units of "Insulin" and had felt well and comfortable on a diet detailed by Dr. McDonald. For breakfast he had taken sixty grammes (two ounces) of lettuce or tomato, one egg and bacon or two eggs. At dinner he had taken one hundred and twenty grammes (four ounces) of chops, sixty grammes of lettuce or tomato and a small quantity of baked bread. At tea he had taken two eggs, sixty grammes of vegetables and some bread and butter. The total value of this diet had been about eleven hundred calories. Dr. McDonald said that this was not a very liberal diet, but the patient had been content with it and was feeling more cheerful and energetic than he had done for months. Dr. McDonald had reported this patient's condition because it was a contrast to that of a patient whom it was Dr. Duhig's intention to report. The patient's history, moreover, illustrated the fact that age alone was no contra-indication to the use of "Insulin" nor as far as he knew were heart disease, pulmonary tuberculosis, renal disease or any acute or chronic disease.

NOTICES.

MEMBERS of the New South Wales Branch are notified that, in regard to the proposed complimentary dinner (April 10, 1924) to the medical officers in the ships of the Royal Naval Squadron to visit Sydney, advice has been received that the medical officers are not accepting invitations of this character as a body, preferring rather to join with their fellow officers in the general entertainment.

Public Health.

WESTERN AUSTRALIA.

THE COMMISSIONER OF PUBLIC HEALTH AND PRINCIPAL MEDICAL OFFICER OF WESTERN AUSTRALIA, DR. R. C. EVERITT ATKINSON, had issued his report upon the work carried out by the Public Health and Hospitals Department for the two years ended December 31, 1922. In his opening remarks the Commissioner expresses regret that the report for 1921 was delayed.

Financial.

The total expenditure of the Department for 1921 was £189,524 and for 1922 £177,244. As far as the Medical Branch of the Department is concerned the expenditure

was almost entirely confined to providing medical and hospital service for the community. The hospital expenditure has been reduced from £167,543 in 1920 to £147,824 in 1922. The saving was effected by the introduction of strict economy in several of the State institutions. If the special expenditure in 1920 in connexion with the influenza pandemic be excluded, the expenditure of the Public Health branch has remained at about the same figure. The Commissioner states that public health and hospital services to the community cannot and should not be viewed principally from the point of view of pounds, shillings and pence. Cessation of expenditure may easily be false economy. Real economy consists in seeing that twenty shillings value shall be received for every pound spent. The financial condition of the State is such that various necessary forms of hospital service must be denied to the people on this account. With few exceptions those in charge of Government hospitals are not able to take full advantage of many of the lessons learned by the medical profession during the war. The Commissioner pleads for a more liberal financial grant for this purpose.

Government Hospitals.

At the close of 1922 the Department was managing nineteen hospitals and two casualty wards. The number of patients treated at these institutions was 5,118 in 1920, 4,206 in 1921 and 3,877 in 1922. The average number of beds occupied was 255.4 in 1920, 230.9 in 1921 and 207.7 in 1922. The cost has increased. The cost per patient per day was nine shillings and one penny in 1920 and 1921. In 1922 it was ten shillings and four pence. The increase in cost per patient is attributed to the large decrease in the average number of beds occupied.

District Medical Officers.

For many years past a system has been in force whereby medical practitioners were subsidized in order to encourage their settlement in country areas where they would otherwise hardly be expected to take up practice. Where a Government hospital existed it was customary to pay a salary to one of the medical practitioners in the district in order that he should supervise and carry out medical treatment at such institution. At the beginning of 1922 it was decided to abolish the position of district medical officers in those towns in which more than one practitioner resided. It was arranged that all medical practitioners residing in a district supplied with a Government hospital should have the right to send their patients into the institution. In return it was arranged that medical practitioner should attend indigent patients in hospital in an honorary capacity. The Commissioner points out that this arrangement has had a two-fold effect. In the first place practically all Government hospitals have been turned into intermediate hospitals. There has also been a considerable saving in subsidy payments.

After a passing reference to the "sudden death" of the hospitals bill in the Legislative Council, the Commissioner proceeds to discuss hospital finance. The sum of £180,000 *per annum* is required for the upkeep of the hospitals of the State. Of this total £101,028 was provided by the State in 1921 and £93,238 in 1922. The balance required is made up by maintenance fees collected, subscriptions and donations and various special efforts. A certain amount of revenue is earned by the hospitals in the treatment of patients for the Department of Repatriation and by the carrying on of venereal clinics. The Commissioner claims that the system of voluntary contributions has never been in force in Western Australia. The main burden of hospital support has fallen upon the State to the extent of about £100,000 *per annum*. As a result of the shortage in money it has not been possible to take reasonable advantage of the recent advance in medical science in any of the hospitals of the State with the possible exception of the Perth Hospital. This institution benefited by the transfer of some equipment from the Military Base Hospital at Fremantle. The Commissioner lays stress on the need for establishment of some fund which will place hospital finances on a sound footing. He also states that it is only reasonable that certain

safeguards should be imposed to ensure that every penny would be wisely spent.

Vital Statistics.

The population of Western Australia in 1922 was 339,424; in 1920 it was 329,544. The births in 1922 numbered 8,131; in 1921 the number was 7,807 and in 1920 8,149. The birth rate per thousand of population was 24.0 in 1922, 23.4 in 1921 and 24.4 in 1920. The death rate per thousand of population was 9.3 in 1922, 10.4 in 1921 and 10.14 in 1920. When compared with the figures of other States it is seen that Western Australia occupied the fourth place in regard to the birth rate. Tasmania has the highest birth rate, namely 27.1 per thousand. Tasmania and Western Australia occupy the second place in the death rates for 1922. Victoria had the highest death rate per thousand. In regard to infantile mortality Western Australia occupies second place with 55.7 per thousand. Tasmania heads the list in this regard. In discussing the infantile mortality the Commissioner points out that the increase was partly due to the increased number of deaths from infantile diarrhoea, although it is generally recognized that the incidence of enteritis is largely dependent upon seasonal variations. The Commissioner recognizes that many of the deaths of infants from this cause at all seasons are preventible. Prevention can mainly be secured by the spreading of knowledge in regard to the feeding of mothers and infants.

Notifiable Infective Diseases.

Typhoid Fever.

The number of cases of typhoid fever notified during 1922 was two hundred and forty-four, in 1920 three hundred and sixty-seven. The case mortality was 10.2% in 1922, 10.9% in 1921 and 7.9% in 1920. The Commissioner points out that although the number of cases is less in 1922 the position is unsatisfactory. The disease is definitely preventible and its prevalence affords an index of the insanitary condition of a country and the habits of its people. The increase in the case mortality is ascribed to an increased virulence in the type of the disease. In 1922 a larger proportion of the cases occurred outside the metropolitan area in places in which facilities for adequate treatment were not altogether satisfactory. Reference is made to an epidemic which occurred in the Hotham Valley. In this outbreak some seventy persons were infected. It was found that the apparently satisfactory water supply was being freely contaminated with polluted creek water. Preventive inoculation was not advised during the prevalence of the disease. In the following spring, however, an inoculation campaign was instituted and considerable numbers of the population availed themselves of the facilities.

Dysentery.

Twenty-one cases of dysentery were notified during 1921 and ten during 1922, the number in 1920 was forty-nine. The Commissioner thinks it probable that a considerable number of cases of bacillary dysentery are not diagnosed. The reports of the Government Statistician indicate that during the two years under review one hundred and thirteen persons over two years of age died of diarrhoea and enteritis of unsuspected causation and recent work in other Australian States indicates that dysentery bacilli are not infrequently found in cases of infantile diarrhoea. The Commissioner states that the high infantile mortality from diarrhoea and enteritis affords striking evidence of the need to which he has repeatedly referred, for the initiation of infant welfare work in the State. Fatal diarrhoea in infants is preventible in the great majority of instances and it affects not only those who are young and weakly, but also infants whose general health has been satisfactory for some months. During the two years under review 69% of the deaths recorded under this heading occurred in the metropolitan area, while only only 53% of the births took place in this locality.

Scarlet Fever.

Ninety-six cases of scarlet fever were notified during 1922. During this year the State was regarded as being in the trough of the wave of prevalence of this disease.

The number of cases in 1919 was six hundred and fifty-seven. The Commissioner expects a rise in the number of infections to occur in the near future.

Whooping Cough.

During 1921 a severe epidemic of whooping cough occurred through the State; there were fifty-eight deaths. The average number of deaths for the preceding four years was thirteen. Twenty-nine of the deaths in 1921 occurred in infants under the age of one year and the majority were due to complications. It is stated that the prevention of a fatal result is largely a matter of education and training of mothers.

Diphtheria.

During 1922 five hundred and seventy-seven cases of diphtheria were notified. The number in 1921 was nine hundred and fifty-eight; in 1920 it was one thousand and eighty. In 1922 there were twenty-one deaths, a case mortality of 3.6%. In 1921 there were forty-four deaths and the case mortality was 4.59%. It is stated in the report that the Department continues to assist local authorities in maintaining stocks of antitoxin in country districts. Apparently no organized attempt has been made to apply the Schick test or active immunization to the control of the disease.

Tuberculosis.

During 1922 three hundred and eighty-seven cases of pulmonary tuberculosis were notified. In 1921 the number was four hundred and twenty-four and in 1920 four hundred and forty-two. The case mortality in each of these three years was respectively 8.08%, 7.9% and 7.6%. The Commissioner points out that although the number of cases notified is less, the number of deaths diminishes more slowly and the disease continues to hold its position as the chief single cause of death. An increase in the mortality from tuberculosis was experienced in many countries during the latter years of the war. As soon as hostilities ceased, the mortality receded to the level of or below that of the period just preceding the outbreak of war. In Western Australia a similar rise was evident and, though this was relatively small, it is apparently being retained longer there than elsewhere. The mortality from tuberculosis of the lungs is higher in Western Australia than in the Commonwealth as a whole. It is thought that this may to some extent be due to the somewhat peculiar constitution of the population of the State. Western Australia contains a greater proportion of adults, particularly adult males, than is found in the population of the whole Commonwealth. To that extent the excess of tuberculosis is more apparent than real. The excess is probably mainly due to the fact that one of the primary industries of the State is one in which the risks of predisposition to and infection with tuberculosis are exceptionally great. The hope is expressed that effective steps will soon be taken to free the mining industry of what is from the social point of view its chief drawback.

Influenza.

In 1919 during the influenza pandemic there were five hundred and forty-four deaths from influenza. In 1920 the deaths numbered thirty, in 1921 the deaths numbered fifty-eight and in 1922 twenty-two. In 1921 the increase in deaths from influenza was accompanied by an increase in deaths from respiratory diseases. Commenting on the type of disease labelled influenza the Commissioner states that the disease was characterized by a moderate pyrexia of about one week's duration. There was an intermission and a remission of symptoms about the third day and the temperature chart assumed a "saddle back" appearance. There was a rash of indefinite character, chiefly upon the dorsal aspect of the extremities, and some glandular swelling, especially of the cervical glands. Catarrhal signs were generally absent. Many practitioners who had had experience of dengue fever, regarded the condition as dengue. "Mosquitoes were very prevalent at the time."

Malaria.

Thirty-nine cases of malaria were notified during 1921 and forty-one in 1922. Twenty of the cases notified in 1921 were recorded from Wyndham, six from Derby and

two from Broome. Of the 1922 total twenty-two were from Wyndham, five from Broome and one from Onslow. The remainder of persons affected had contracted the disease overseas. No fresh infections were recorded in the south-western portion of the State, although anopheline mosquitoes continue to be found there in moderate numbers.

Beri Beri.

Thirty-one cases of beri beri were notified in 1921 with nine deaths and thirty-eight in 1922 with thirteen deaths. All these cases except seven occurred in Asiatics engaged in the pearling industry.

Puerperal Sepsis.

Sixteen cases of puerperal septicæmia were notified in 1921 and ten in 1922. In each instance the midwife concerned was visited by the supervisory nurse or was advised by the Department through some other channel in order to insure that the necessary precautions were taken to avoid the transmission of the infection through her agency. The death rate from puerperal septicæmia was 0.7 per thousand in 1921 and 0.9 per thousand in 1922. Taking into consideration deaths from all causes of the puerperal state approximately four mothers die for each thousand babies born. The Commissioner states that this rate is about the same as in other countries in which relevant statistics are published.

Venereal Diseases.

Western Australia has been to a large extent a pioneer in attempts to combat venereal disease and the report in regard to these diseases is very interesting. During 1921 the number of new cases of venereal disease notified was 1,115, in 1922 the number was 727, a reduction of 384 on the previous year. Of the cases notified in 1921, 940 occurred in males and 175 in females. These numbers included 906 gonorrhœal infections and 164 infections with syphilis. The proportion of females among those whose condition was notified was greater in 1921 than in the previous year. The Commissioner holds that this represents a greater willingness on the part of women to seek medical attention and also an increased knowledge of the subject and of the benefits to be derived from early recognition of the disease and its early treatment. A larger number of tertiary cases of syphilis were notified and this is regarded as being possibly due to the more sensitive ice box method of performing the Wassermann test having brought to light cases not previously diagnosed as syphilis. Of the 727 cases of venereal disease notified in 1922, 632 occurred in males and 95 in females. Of the total cases recorded 591 were gonorrhœal and one hundred and three were syphilitic. In 1921 legal proceedings were taken against twenty-three males and one female for refusing consistently to resume treatment. In ten instances a conviction was recorded. In eight the proceedings were stopped on evidence being produced that treatment had been resumed prior to the hearing of the case. Two cases were adjourned *sine die* and four were pending at the end of the year under review. Two statements were received alleging infection of certain individuals, but as the complaints had been made anonymously no action was taken. In 1922 legal proceedings were taken against twenty-three persons for persistent refusal to resume treatment. Nine convictions were recorded and fourteen cases were withdrawn when the patient resumed treatment on the service of the summons. In one instance proceedings were taken against a female for "knowingly infecting" while under treatment for venereal disease. The Commissioner views the reduced incidence of venereal disease with great satisfaction. He thinks that the results have justified the measures which have been taken to cope with the problem of these diseases. There has been no falling off in the number of medical practitioners from whom notifications have been received and hence there is no reason to think that failure to notify cases is the cause of the reduction. Moreover, the public has been so well informed of the nature of venereal disease and the severe consequences likely to follow neglect of treatment that there is little reason to think that notification is acting as a deterrent. It is difficult to believe

that sufferers when first affected would neglect treatment on the grounds that at some future date they might cease to attend and be reported. The majority of patients in the early stages manifest a desire for treatment. It is only when treatment has become irksome that the idea of non-attendance for treatment suggests itself. To the individual patient the Department is not unreasonable. Persons who default, are given ample opportunity to resume before proceedings are taken. The desire of the Department is to help and not to prosecute.

Medical Inspection of School Children.

In Western Australia the inspection of school children is in the hands of the Department of Public Health. The work during the period under review was carried out by one medical officer and two nurses. It had been hoped that another medical officer would be appointed, but the cutting down of the estimates made this impossible. The Commissioner claims that good use is made of the limited staff available. Children are examined twice in the course of their schooling, once soon after entry to school and once just before leaving school to begin work. Schools are visited once a year and in this way children requiring special attention can be seen more frequently. This only applies to the children of the metropolitan schools. In regard to the country schools it had been intended to have examinations carried out by district medical officers or local medical practitioners. These gentlemen were to have been paid a small fee for each child examined. Through lack of funds this could not be carried out. The Commissioner points out that this is grossly unfair to the children in the country. He holds that another medical officer and another nurse should be appointed in order that the work could be carried out satisfactorily. Much better value for the money would be obtained by the appointment of another medical officer than by leaving the work to local practitioners. During 1921 the number of children examined in the metropolitan district was 3,051 and outside this area 929. In 1922 the numbers were respectively 8,057 and 1,167. During 1921 no less than 70% of the children showed some defect or condition worthy of notification. In 1922 the proportion was 77%. A large number of defects were of relatively minor significance and included such conditions as lack of cleanliness of the teeth, tendency to postural defect or to overgrowth of tonsils or adenoids or the presence of a few lice eggs in the hair. In 1922, however, 22% of the children were in need of medical advice or attention and 40% of them required attention at the hands of a dentist. The Commissioner deplors the fact that funds were not made available for the appointment of a dentist to remedy these defects. At the same time he pays a tribute to the honorary work carried out for the Department by members of the Odontological Society for many necessitous children.

Bacteriological and Pathological Laboratory.

A long and detailed statement is given in an appendix of the examinations carried out at the Bacteriological and Pathological Laboratory belonging to the Department. It is unnecessary in a short summary like the present to discuss these in any detail. Reference is made to the work carried out by Dr. Shearman in regard to the Wassermann test and published in THE MEDICAL JOURNAL OF AUSTRALIA. Dr. Shearman's methods have been adopted and have given very satisfactory results.

Departmental Visiting Nurses.

The visiting nurses of the Department carry out important work in regard to the supervision of registered midwives. In this connexion 1,083 visits were paid by the nurses in 1921 and 1,174 during 1922. The nurses also visited maternity homes and as a result it is claimed that these institutions are conducted on satisfactory lines. Five hundred and four visits of inspection were made during 1921 and six hundred during 1922. Visits to tuberculous patients were continued and the number of visits in the two years under review were respectively 2,047 and 2,165. The same thing occurs in this branch of the work as in that of the inspection of school children. The country centres only receive spasmodic attention in place of regular routine visits.

Obituary.

ARTHUR JOHN NYULASY.

THE death of Dr. Arthur John Nyulasy which occurred on February 28, 1924, in Melbourne, at the residence of his brother Dr. Frank Nyulasy and was recorded in our issue of March 15, 1924, occasioned much regret, not only amongst members of the medical profession in Perth, Melbourne and other parts of the Commonwealth, but amongst a large circle of friends.

Arthur John Nyulasy was a man of wide experience and scholarly attainment. As a young man he conceived the idea of becoming an engineer and with this end in view entered the Engineering School at the University of Melbourne. He soon found, however, that his avocation lay in another direction and the result was that after gaining a certificate as an authorized surveyor, he left the Engineering School and became a student of medicine. Four years of his training were spent in Melbourne and he decided to travel and complete his curriculum abroad. With this object in view he went to Edinburgh, London, Paris and Berlin. In 1890 he gained the diplomas of licentiate of the Royal College of Physicians and of the Royal College of Surgeons of both Edinburgh and Glasgow. The following year he became a member of the Royal College of Surgeons of England and a licentiate of the Royal College of Physicians of London. Soon after this Arthur John Nyulasy returned to Australia and became assistant to his brother at Toorak. In Melbourne he did not enjoy good health and subsequently found a more suitable climate at Perth, Western Australia. Here he laid the foundations of a sound and extensive practice which he carried on until shortly before his death. Soon after his arrival in Perth, Arthur John Nyulasy was able to render a very important service to the community. An epidemic of typhoid fever had broken out and he sought to discover its origin. In this he was successful and his conclusion that the water supply was being contaminated by saw-millers living in insanitary surroundings on the catchment area was subsequently confirmed by the independent investigation of Dr. Cherry who was then lecturer on bacteriology in the University of Melbourne.

At the time of the South African war Arthur John Nyulasy offered his services to the Empire and joined the forces as medical officer with a contingent from Western Australia. On his return from active service he was elected a member of the honorary staff of the Perth Hospital. He became in succession surgeon to out-door patients, surgeon to in-patients, gynaecologist to out-patients and gynaecologist to in-patients. At the time of his death he was senior gynaecologist to the institution. He was peculiarly suited to the calling of a surgeon. His powers of observation, initiative and resource brought him no uncertain measure of success in his work. As a surgeon he recognized the duty which he owed to his brother practitioners and to the science of medicine. In his contribution to medical literature he endeavoured to allow others to benefit from his experience and by his original observations to add his quota to the advancement of the art of surgery.

Probably the most important series of papers which he published were those dealing with the supports of the uterus. His first contribution to this subject was made at the Auckland Congress in 1914. At the Brisbane Congress he introduced the question again and the paper read by him subsequently appeared in the pages of *Surgery, Gynecology and Obstetrics*. A paper on the same subject was read at a meeting of the Royal Academy of Medicine in Ireland and appeared in *The British Medical Journal*. Several of his papers have been published in *THE MEDICAL JOURNAL OF AUSTRALIA* and these have given evidence of originality, insight and logical thinking. The subject of septic peritonitis was one to which he devoted much time and study and he held advanced views in regard to the ligation and excision of veins in puerperal infections.

Arthur John Nyulasy always took an active part in medical gatherings and scientific discussions. He was

Vice-President of the Section of Obstetrics and Gynaecology at the Australasian Medical Congress in 1920. He was a man of artistic tastes. His accomplishments as a musician gave pleasure both to himself and others and he found mental delight in his love of literature. He will be missed both by those who recognized in him a scientific observer and a careful surgeon and by those whom he honoured with his friendship and camaraderie.

WALTER ELI HARRIS.

THE death of Dr. Walter Eli Harris which was recorded in our issue of March 15, 1924, caused widespread regret amongst his friends in the medical profession and amongst the residents of the New England district who had learned to esteem him as a citizen and appreciated his whole-hearted devotion to them as a medical practitioner.

Walter Eli Harris was the son of Mr. J. G. Harris, of Chatswood, New South Wales. He was born on October 14, 1876, and was educated at the Sydney Grammar School. He subsequently became a medical student at the University of Sydney and applied himself with keenness and determination to his studies. He took an interest and an active part in outdoor sport, although he was not fortunate enough to attain prominence in any of its branches. He graduated in December, 1899, as bachelor of medicine and master of surgery, passing the fifth year examination "with credit." Subsequently he was appointed resident medical officer at the Royal Prince Alfred Hospital. He was afterwards promoted to the position of senior resident medical officer and acted for a short term as medical superintendent. In 1902 he took up practice in Armidale in succession to the late Dr. Mallam.

Walter Eli Harris was a careful and diligent practitioner. His unremitting attention brought its own reward and before his death he was recognized throughout the New England district as a man who could be trusted without reserve. He was interested more particularly in surgery and gained a reputation as a successful operator.

Walter Eli Harris was not unmindful of his duties as a citizen. He interested himself in the activities of his city and its surrounding district. He was associated with almost every organization and became in turn President of the Armidale School of Arts, the Armidale and New England Jockey Club, the Armidale City Band, the New England Rugby Union, Building Society, Tennis Club, Musical Society and Hospital Race Club. He was medical officer to the Armidale District Hospital and acted for many years as Government Medical Officer.

Walter Eli Harris was keenly interested in music and amongst his hobbies was the collection of pictures and china. He was fond of his library and devoted much time to reading. Much sympathy will be extended to his widow and two sons who survive him.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

THE undermentioned have been registered, under the provisions of the *Medical Act of 1867*, as duly qualified medical practitioners:

- BARRETT, HORACE ROWLAND GUEST, M.B., B.S., 1923 (Univ. Melbourne), Brisbane.
- BURKE, EDMOND PATRICK, M.B., B.S., 1923 (Univ. Melbourne), Isisford.
- BYRNE, CHARLES, M.B., B.S., 1923 (Univ. Melbourne), South Brisbane.
- FINSELBACH, FREDERICK WILLIAM AUGUST, M.B., 1906 (Univ. Sydney), Brisbane.
- FLETCHER, ROBERT HORNER, M.B., Ch.M., 1923 (Univ. Sydney), Gladstone.

KEIRAN, JOHN BERNARD, M.B., B.S., 1922 (Univ. Melbourne), Brisbane.
 McCAFFERTY, GEORGE HENRY, M.B., Ch.B., 1923 (Univ. Edin.), Toowoomba.
 McCAFFERTY, SYDNEY JOSEPH, M.B., Ch.B., 1923 (Univ. Edin.), Toowoomba.
 MURPHY, ALGERNON HAMPDEN, M.B., Ch.M. (Univ. Sydney), Texas.
 OLDHAM, ALFRED, M.B., B.S., 1923 (Univ. Melbourne), Ipswich Hospital, Ipswich.
 ORCHARD, ETHEL ADELAIDE, L.R.C.P. & S., 1908 (Edin.), L.F.P. & S., 1908 (Glasg.), Camooweal.
 STOBO, JOYCE SELDON, M.B., Ch.M., 1923 (Univ. Sydney), Brisbane.
 TAYLOR, HENRY JOHN, M.B., Ch.M., 1923 (Univ. Sydney), Townsville Hospital, Townsville.

VICTORIA.

THE undermentioned have been registered, under the provisions of the *Medical Act, 1915*, as duly qualified medical practitioners:

BALBONI, TULLIO, M.D. *et* Ch.D., 1922 (Rome), c.o. Mr. Wilcocks, Lister House, Collins Street, Melbourne.
 FRASER, STUART, M.B., B.S., 1923 (Univ. Melbourne), 25, Fellows Street, Kew.
 LOWE, CHARLES EDWIN MAXIMILIAN, M.B., B.S., 1892 (Vict. Univ. Manchester), Dimboola.
 LYSTER, ARTHUR EDWARD, L.S.A., 1883 (Lond.), M.R.C.S., 1886 (Eng.), Colac.
 NELSON, WILLIAM THOMAS, M.B. *et* Ch.M., 1918 (Univ. Sydney), M.R.C.P., 1923 (London.), c.o. Secretary, B.M.A., Brunswick Street, East Melbourne.

Additional Diploma Registered.

CATCHLOVE, SYDNEY GEORGE LEYLAND, M.S., 1923 (Univ. Melbourne).

Names of Deceased Practitioners Removed from the Register.

ANDERSON, THOMAS COCHRANE.
 JONES, RICHARD.
 NYULASY, ARTHUR JOHN.

TASMANIA.

THE undermentioned additional diploma has been registered:

ATKINS, CHARLES NORMAN, D.P.H. 1920 (Oxford), Hobart.

Medical Appointments.

DR. I. C. HAINS (B.M.A.) has been appointed Visiting Medical Officer to the Bundaberg Baby Clinic, Queensland.

DR. R. T. BINNS has been appointed a Resident Medical Officer at the Adelaide Hospital.

DR. E. S. MORRIS (B.M.A.) has been appointed a member of the Supply and Tender Board of Tasmania.

DR. R. F. MAY has been appointed Junior Resident Medical Officer at the Perth Hospital.

Medical Appointments Vacant, etc..

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY: Honorary Bio-Chemist.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmmain United Friendly Society's Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phoenix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary Limited Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Remark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

APR. 2.—Victorian Branch, B.M.A.: Branch.
 APR. 4.—Queensland Branch, B.M.A.: Branch.
 APR. 9.—Tasmanian Branch, B.M.A.: Branch.
 APR. 9.—Melbourne Pediatric Society.
 APR. 10.—Brisbane Hospital for Sick Children: Clinical Meeting.
 APR. 11.—Queensland Branch, B.M.A.: Council.
 APR. 11.—South Australian Branch, B.M.A.: Council.
 APR. 16.—Victorian Branch, B.M.A.: Council.
 APR. 16.—Western Australian Branch, B.M.A.: Branch.
 APR. 24.—South Australian Branch, B.M.A.: Branch.
 APR. 25.—Queensland Branch, B.M.A.: Council.
 MAY 2.—Queensland Branch, B.M.A.: Branch.
 MAY 7.—Victorian Branch, B.M.A.: Branch.
 MAY 8.—Brisbane Hospital for Sick Children: Clinical Meeting.
 MAY 9.—Queensland Branch, B.M.A.: Council.

Editorial Notices.

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